Revised By
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Dear students:

It is extremely great pleasure to introduce the mathematics book for fifth primary. We have been specially cautious to make learning mathematics enjoyable and useful since it has many practical applications in real life as well as in the other subjects. This gives you a chance to be aware of the importance of learning mathematics, to determine its value and to appreciate the mathematicians roles.

This book sheds new lights on the activities as a basic objective. Additionally, we have tried to introduce the subject simply and excitingly to help attaining mathematical knowledge as well as gaining the patterns of positive thinking skills which pave your way to creativity.

This book is divided into units, each unit contains lessons. Colors and pictures are effectively used to illustrate some mathematical concepts and the properties of figures. Lingual level of previous study has also been taken into consideration.

Our great interest here is to help you get the information by yourself in order to develop your self-learning skills.

Calculators and computer sets are used when there’s a need for. Exercises, practices, general exams, Activities, unit test, general tests, and final term tests attached with model answers have been included to help you review the curriculum completely.

Eventually, we hope getting on the right track for the benefits of our students as well as for our dearest Egypt hoping bright future to our dearest students.

Authors
## Contents

### First Term:

**Unit one: Fractions**

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Approximating to the nearest hundredth and thousandth</td>
<td>4</td>
</tr>
<tr>
<td>Two</td>
<td>Comparing fractions</td>
<td>10</td>
</tr>
<tr>
<td>Three</td>
<td>Multiplication: Multiplying fractions and decimal numbers by 10, 100, 1000</td>
<td>15</td>
</tr>
<tr>
<td>Four</td>
<td>Multiplying a fraction or a decimal number by an integer number</td>
<td>17</td>
</tr>
<tr>
<td>Five</td>
<td>Multiplying common fractions</td>
<td>19</td>
</tr>
<tr>
<td>Six</td>
<td>Multiplying decimal fractions</td>
<td>20</td>
</tr>
<tr>
<td>Seven</td>
<td>Division: (1) Dividing fractions</td>
<td>23</td>
</tr>
<tr>
<td>Eight</td>
<td>(2) Dividing fractions and decimal numbers by 10, 100, 1000</td>
<td>25</td>
</tr>
<tr>
<td>Nine</td>
<td>(3) Dividing an integer by a 3-digit number without having a remainder</td>
<td>27</td>
</tr>
<tr>
<td>Ten</td>
<td>(4) Division by a decimal fraction and by a decimal number</td>
<td>29</td>
</tr>
</tbody>
</table>

**General Exercises**  
**Activity**  
**Unit Test**

### Unit Two: Sets

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>What is a set?</td>
<td>42</td>
</tr>
<tr>
<td>Two</td>
<td>Mathematical expression of a set</td>
<td>44</td>
</tr>
<tr>
<td>Three</td>
<td>Belonging of an element to a set</td>
<td>47</td>
</tr>
<tr>
<td>Four</td>
<td>Types of sets</td>
<td>49</td>
</tr>
<tr>
<td>Five</td>
<td>Equal sets</td>
<td>51</td>
</tr>
<tr>
<td>Six</td>
<td>Inclusion and subsets</td>
<td>53</td>
</tr>
<tr>
<td>Seven</td>
<td>Intersection of two sets</td>
<td>56</td>
</tr>
<tr>
<td>Eight</td>
<td>Union of two sets</td>
<td>59</td>
</tr>
</tbody>
</table>
Lesson Nine: The universal set ................................................. 61
Lesson Ten: The complement of a set ........................................ 63
Lesson Eleven: The difference of two sets ................................... 65

General Exercises .............................................................. 67
Activity ................................................................................. 69
Unit Test ................................................................................. 70

Unit Three: Geometry
Lesson One: The Circle ......................................................... 72
Lesson Two: Drawing a triangle given the lengths of its three sides 76
Lesson Three: Drawing line segments from the vertices of a triangle perpendicular to its opposite sides ................................................................. 79

General Exercises .............................................................. 83
Activity ................................................................................. 85
Unit Test ................................................................................. 86

Unit four: Probability
Lesson One: Experimental Probability ........................................ 88
Lesson Two: Theoretical Probability .......................................... 91

General Exercises .............................................................. 94
Activity ................................................................................. 95
Unit Test ................................................................................. 96

General Exams ...................................................................... 97
Answers ................................................................................. 100
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Set of counting numbers</td>
<td>≤</td>
<td>Less than or equal to</td>
</tr>
<tr>
<td>E</td>
<td>Set of even numbers</td>
<td>=</td>
<td>Equal to</td>
</tr>
<tr>
<td>O</td>
<td>Set of odd numbers</td>
<td>≠</td>
<td>Not equal to</td>
</tr>
<tr>
<td>P</td>
<td>Set of prime numbers</td>
<td></td>
<td>Open curve</td>
</tr>
<tr>
<td>ø or {}</td>
<td>Null set or empty set</td>
<td></td>
<td>Closed curve</td>
</tr>
<tr>
<td>∈</td>
<td>Belonging</td>
<td></td>
<td>Circle</td>
</tr>
<tr>
<td>∉</td>
<td>Not belonging</td>
<td>r</td>
<td>radius</td>
</tr>
<tr>
<td>⊆</td>
<td>Inclusion</td>
<td>π</td>
<td>Approximate ratio</td>
</tr>
<tr>
<td>⊊</td>
<td>Not inclusion</td>
<td>AB</td>
<td>Line segment AB</td>
</tr>
<tr>
<td>∪</td>
<td>Union</td>
<td></td>
<td>Ray AB</td>
</tr>
<tr>
<td>∩</td>
<td>Intersection</td>
<td>AB</td>
<td>Straight line AB</td>
</tr>
<tr>
<td>U</td>
<td>Universal set</td>
<td></td>
<td>Angle</td>
</tr>
<tr>
<td>Xᶜ</td>
<td>Complement set</td>
<td>m (∠ B)</td>
<td>Measure angle (B), m (∠ B)</td>
</tr>
<tr>
<td>X−Y</td>
<td>X difference Y</td>
<td>P (E)</td>
<td>Probability of event E P (E)</td>
</tr>
<tr>
<td>N</td>
<td>Set of natural numbers</td>
<td>≡</td>
<td>Congruent</td>
</tr>
<tr>
<td>&gt;</td>
<td>More than</td>
<td>Δ</td>
<td>Triangle</td>
</tr>
<tr>
<td>≥</td>
<td>More than or equal to</td>
<td>(X, Y)</td>
<td>Ordered pair X, Y (X, Y)</td>
</tr>
<tr>
<td>&lt;</td>
<td>Less than</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Unit One
Fractions
1. Convert the following fractions to fractions with denominator 10, then convert to the decimal form:

   Example: \( \frac{14}{5} = \frac{28}{10} = 2.8 \)

   \[ \begin{align*}
   A \quad \frac{5}{2} = & \quad \frac{10}{10} = \ldots \ldots \\
   B \quad \frac{36}{30} = & \quad \ldots \ldots = \ldots \ldots \\
   C \quad \frac{55}{50} = & \quad \ldots \ldots = \ldots \ldots \\
   D \quad \frac{14}{20} = & \quad \ldots \ldots = \ldots \ldots \\
   E \quad \frac{45}{50} = & \quad \ldots \ldots = \ldots \ldots \\
   F \quad \frac{95}{25} = & \quad \ldots \ldots = \ldots \ldots 
   \end{align*} \]

2. Write down the following numbers in the form of decimal numbers (as shown):

   Example: \( 12 \frac{23}{50} = 12 \frac{46}{100} = 12.46 \)

   \[ \begin{align*}
   A \quad \frac{8}{25} = & \quad \ldots \ldots \\
   B \quad \frac{37}{4} = & \quad \ldots \ldots \\
   C \quad \frac{129}{50} = & \quad \ldots \ldots \\
   D \quad \frac{115}{500} = & \quad \ldots \ldots 
   \end{align*} \]

3. Write down the following numbers in the form of an integer number and a fraction (as shown):

   Example: \( 3.28 = 3 \frac{28}{100} = 3 \frac{7}{25} \)

   \[ \begin{align*}
   A \quad 7.35 = & \quad \ldots \ldots \\
   B \quad 6.07 = & \quad \ldots \ldots \\
   C \quad 12.56 = & \quad \ldots \ldots \\
   D \quad 9.003 = & \quad \ldots \ldots 
   \end{align*} \]

4. Put the following numbers in their appropriate places inside the rectangles below:

   \( 328, 382, 350 \)

   Then complete:

   \[ \begin{align*}
   328 \approx & \quad \ldots \ldots \text{to the nearest hundred} \\
   382 \approx & \quad \ldots \ldots \text{to the nearest hundred} \\
   350 \approx & \quad \ldots \ldots \text{to the nearest hundred} \\
   \end{align*} \]
5. Complete the following table:

<table>
<thead>
<tr>
<th>Number</th>
<th>Number to the nearest 10</th>
<th>Number to the nearest 100</th>
<th>Number to the nearest 1000</th>
<th>Number to the nearest unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>4723.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7259.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64345.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Match each number with its approximated value to the nearest unit:

- 75.57
- 47\frac{2}{3}
- 75\frac{4}{9}

7. Approximate the following numbers to the nearest tenth:

- A 63.23
- B 432.76
- C 7023.54
- D 367\frac{3}{4}
- E 24\frac{3}{20}
- F 7\frac{3}{50}

8. Find the sum of the following operations, then approximate the sum according to the approximation required:

- A \(32.27 + 13.5\) = \(\ldots\) \(\approx\) \(\ldots\) to the nearest tenth.
- B \(18.07 + 421.45\) = \(\ldots\) \(\approx\) \(\ldots\) to the nearest unit.
- C \(854.49 - 32.71\) = \(\ldots\) \(\approx\) \(\ldots\) to the nearest ten.
- D \(743.65 - 512.28\) = \(\ldots\) \(\approx\) \(\ldots\) to the nearest tenth.
Approximating to the nearest hundredth and thousandth

You will learn:
- To approximate to the nearest hundredth.
- To approximate to the nearest thousandth.

Think and discuss:
The teacher asked Fared and Huda to approximate 172.476 to the nearest hundredth.

Fared answered:
The number 172.476 is between 172.47 and 172.48.
However, it is closer to 172.48 than 172.47.
Therefore, $172.476 \approx 172.48$ approximated to the nearest hundredth.

Hoda suggested:
Using the opposite flow chart to approximate the number to the nearest hundredth.

Key Terms:
- Approximating
- Hundredth
- Thousandth

Mathematics - Fifth Primary
1. **Practice**

Approximate the following numbers to the nearest hundredth:

- A. \( 76.514 \approx 76.51 \)
- B. \( 52.608 \approx 52.61 \)
- C. \( 175.325 \approx \) ..........
- D. \( 69.743 \approx \) ..........
- E. \( 0.737 \approx \) ..........
- F. \( \frac{17}{500} \approx \) ..........

2. **The capacity of a cola bottle = 0.192 liters**

\[ \approx 0.19 \text{ liters} \]

(to the nearest hundredth)

A micrometer is a device used for precise measuring. It is used to measure the thickness of a paper and it was \( 0.136 \text{ mm} \).

Complete: the thickness of the paper \[ \approx \) .......... \text{ mm}. (to the nearest hundredth)

3. **Think**

The reading of the opposite gas meter
\[ \approx \) .......... \text{ cubic meter} \]

(approximate to the nearest hundredth.)
The teacher asked Hend to approximate the number 31.6452 to the nearest thousandth.

The number 31.6452 is between 31.645 and 31.646. However, it is closer to 31.645 than 31.646.

Therefore, $31.6452 \approx 31.645$

**Think and discuss**

**Practice**

In the opposite figure: Complete the flowchart to represent the steps followed to approximate to the nearest thousandth.

**Example**

Approximate 4.6798 to the nearest thousandth.

**Result:**

The digit at the thousandth place is 9, the digit at the ten thousandth's place is 8 which is greater than 5. Therefore, we increase the digit at the thousandth's place by one. Then, it will be $4.6798 \approx 4.680$

**Note that**

When approximating to the nearest thousandth, the result of approximating must include 3 decimal digits even if the digit at the thousandth's place is equal to zero.
1. Complete the following table:

<table>
<thead>
<tr>
<th>Number</th>
<th>approximate to the nearest hundredth</th>
<th>approximate to the nearest thousandth</th>
</tr>
</thead>
<tbody>
<tr>
<td>43.5426</td>
<td>43.54</td>
<td>43.543</td>
</tr>
<tr>
<td>537.2983</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21.84792</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.38327</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.5297</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Complete:

The length of a cell measured by a microscope = 0.3527 mm
≈ .......mm to the nearest thousandth

Each tablet contains some ingredients as shown in the following table:

<table>
<thead>
<tr>
<th>Compound</th>
<th>Weight in (gm)</th>
<th>Weight approximated to the nearest thousandth</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.0032</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0.0546</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.1379</td>
<td></td>
</tr>
</tbody>
</table>

Example

Given that \( L = 52.3723 \), \( M = 21.7494 \). Estimate the sum of \( L + M \) then compare your estimation with the sum to the nearest hundredth.

Result:

\[
\begin{align*}
L &= 52.3723 \\
M &= 21.7494 \\
L + M &= 52.3723 + 21.7494 \\
 &= 74.1217
\end{align*}
\]

\( \approx 74.12 \) Since the value is closer to the estimate, the value is acceptable.

Estimate the result

Estimate of \( L = 52 \)
Estimate of \( M = 22 \)
Estimate of \( (L + M) = 74 \)
Ahmed bought some stuff from a shopping center. Can you estimate the total of what he paid in LE approximating it to the nearest ten pounds? Make sure that your estimation is acceptable for the actual sum.

<table>
<thead>
<tr>
<th>price (LE)</th>
<th>item</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.25</td>
<td>soap</td>
</tr>
<tr>
<td>68.75</td>
<td>washing powder</td>
</tr>
<tr>
<td>64.75</td>
<td>perfumes</td>
</tr>
<tr>
<td>98.25</td>
<td>meat</td>
</tr>
<tr>
<td>170.5</td>
<td>clothes</td>
</tr>
<tr>
<td>28.25</td>
<td>vegetables</td>
</tr>
</tbody>
</table>

**Exercises**

1. Approximate 4.7398 to the nearest
   - hundredth
   - thousandth

2. Choose the correct answer from parantheses:
   - 736.592 = 736.59 to the nearest ............
     (tenth - hundredth - thousandth).
   - 82.497 = 82.50 to the nearest ............
     (tenth - hundredth - thousandth).
   - $3 \frac{1}{8} = \ldots$ to the nearest hundredth .
     (3.10 - 3.12 - 3.13)
   - $13.376 + 15.75 = \ldots$ to the nearest hundredth.
     (29.13 - 29.12 - 29.10)
3. \(37.4289 - 14.081 = \) to the nearest hundredth.
   \((23.350 - 23.348 - 23.248)\)

4. \(8.657 \text{ meters} = \) to the nearest centimeter.
   \((8.66 - 8.66 - 8.6)\)

3. Write down the smallest decimal fraction that includes the digits (2, 5, 7, 8), then approximate that number to the nearest hundredth and nearest thousandth.

4. Complete:
   A. The number 4.559 \(\approx 4.6\) to the nearest ...........
   B. The difference between \(\frac{41}{500} - 0.473 = \) to the nearest tenth.
   C. \(3\frac{3}{4} - 1\frac{3}{200} = \) to the nearest hundredth.
   D. \(4357 \div 1000 = \) to the nearest hundredth.

5. A road extends for 74389 meters. Find its length in kilometers approximating the result to the nearest hundredth.

6. Complete:
   A. 39 days \(\approx \) weeks.
   B. 255 hours \(\approx \) days.
   C. 12.4658 kilometers \(\approx \) kilometers.
   D. 67 months \(\approx \) years.

7. Given that: \(X = 13.452\), \(Y = 7.273\)
   Find \(X + Y\) approximating the sum to the nearest hundredth.
   Estimate the sum of \(X\) + \(Y\). Is your estimation acceptable? Explain.
Comparing fractions

You will learn:
To compare fractions.

Key Terms:
- greater than >
- less than <
- Equal to =

Think and discuss:

The fraction graphed by the colored section \(\frac{3}{8}\)

The fraction graphed by the colored section \(\frac{3}{-}\)

Put (> , < or =):

<table>
<thead>
<tr>
<th>Fraction 1</th>
<th>Fraction 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{3}{8})</td>
<td>(\frac{3}{1})</td>
</tr>
<tr>
<td>(\frac{3}{8})</td>
<td>(\frac{3}{1})</td>
</tr>
<tr>
<td>(\frac{3}{5})</td>
<td>(\frac{3}{5})</td>
</tr>
<tr>
<td>(\frac{5}{8})</td>
<td>(\frac{2}{5})</td>
</tr>
<tr>
<td>(\frac{8}{10})</td>
<td>(\frac{6}{10})</td>
</tr>
</tbody>
</table>

When the numerator is the same in the two fractions:

\(\frac{8}{17} < \frac{8}{11}\)

because \(17 > 11\)

When the denominator is the same in the two fractions:

\(\frac{8}{11} > \frac{5}{11}\)

because \(8 > 5\)

Practice:

1. Put (> , < or =) to have a true sentence:

\(\frac{7}{13} \quad \frac{5}{13} \quad \frac{8}{25} \quad \frac{8}{13} \quad \frac{7}{9} - \frac{2}{9}\)
1. Rearrange the following fractions ascendingly (from the smallest to the greatest):
\[
\frac{7}{18}, \quad \frac{5}{18}, \quad \frac{1}{18}, \quad \frac{25}{18}, \quad \frac{13}{18}
\]

2. Rearrange the following fractions descendingly (from the greatest to the smallest):
\[
\frac{13}{7}, \quad \frac{5}{7}, \quad \frac{9}{7}, \quad \frac{4}{7}, \quad \frac{11}{7}
\]

3. Find the possible values of X which satisfy the following relations, where X is an integer.
   A. \( \frac{4}{7} < \frac{x}{7} < \frac{8}{7} \)
   B. \( \frac{5}{8} < \frac{5}{x} < 1 \)

4. Rearrange the following fractions once ascendingly and the other descendingly. You can use the number line:
\[
\frac{11}{12}, \quad \frac{5}{12}, \quad \frac{2}{3}, \quad \frac{3}{4}, \quad \frac{5}{6}
\]

### Comparing two fractions with different denominators

Which is greater \( \frac{3}{4} \) or \( \frac{2}{3} \)?

- The fraction \( \frac{3}{4} \) graphed by the colored section.
- The fraction \( \frac{2}{3} \) graphed by the colored section.

\[
\frac{3}{4} = \frac{9}{12} \quad \frac{2}{3} = \frac{8}{12}
\]

\[
\frac{9}{12} > \frac{8}{12} \quad \text{because} \quad 9 > 8
\]

I.e. \( \frac{3}{4} > \frac{2}{3} \)

**Note that:**

\[
\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12} \quad \frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}
\]

i.e. To compare two fractions with different denominators, we find their common denominator. In other words, we find the least common denominator (LCD).
Which is greater \( \frac{3}{5} \) or \( \frac{4}{7} \)?

(LCD) of the two denominators \( 5 \) and \( 7 = 5 \times 7 = 35 \)

\[
\begin{align*}
\frac{3}{5} &= \frac{3 \times 7}{5 \times 7} = \frac{21}{35} \\
\frac{4}{7} &= \frac{4 \times 5}{7 \times 5} = \frac{20}{35}
\end{align*}
\]

Then: \( \frac{21}{35} > \frac{20}{35} \) i.e. \( \frac{3}{5} > \frac{4}{7} \)

**Practice**

Compare the following fractions:

A. \( \frac{3}{4} \cdot \frac{2}{5} \)  
B. \( \frac{7}{9} \cdot \frac{3}{4} \)  
C. \( \frac{3}{5} \cdot \frac{5}{8} \)  
D. \( \frac{7}{12} \cdot \frac{4}{5} \)  
E. \( \frac{4}{5} \cdot \frac{3}{7} \)  
F. \( \frac{7}{8} \cdot \frac{6}{7} \)

**Comparing fractions and decimals**

You can convert common fractions into decimals and you can compare them as you have learned in the approximating lesson (using you calculator)

**Example**

Rearrange the following numbers ascendingly: \( 3\frac{1}{2}, 5, 3.2, 4\frac{1}{3}, 4\frac{2}{7} \).

Note that:
- The smallest number is 3.2, while the greatest number is 5.
- To compare \( 3\frac{1}{2}, 3.2 \)

We compare \( \frac{1}{2}, 0.2 \), i.e., we compare 0.5, 0.2

\[ 0.5 > 0.2 \rightarrow 3\frac{1}{2} > 3.2 \]
To compare $4 \frac{1}{3}$, $4 \frac{2}{7}$ proceed as follows:

\[
\frac{1}{3} = \frac{7}{21}, \quad \frac{2}{7} = \frac{6}{21} \quad \text{then} \quad 4 \frac{1}{3} > 4 \frac{2}{7}
\]

Therefore, the ascending Rearrange is: $3.2, 3 \frac{1}{2}, 4 \frac{2}{7}, 4 \frac{1}{3}, 5$

That Rearrange can be shown on the number line:

Rearrange the following fractions:

first: rearrange $7 \frac{1}{6}, 5.3, 7 \frac{2}{11}, 5 \frac{4}{7}, 6$ descendingly.

second: rearrange $8.11, \frac{4}{5}, 12 \frac{3}{7}, \frac{61}{7}, 12.4$ ascendingly.

---

### Exercises

1. State what the colored section represents in each figure, then rearrange the fractions ascendingly.

   ![Diagram](image)

   Ascending Rearrange: ____________________________
2. Put (√) or (×):

A. 4376 < 0.407  ( )  B. 50.61 > 0.501  ( )
C. \( \frac{7}{8} > 0.775 \)  ( )  D. \( 3.5 > \frac{4}{9} \)  ( )
E. \( 2 \frac{7}{9} < 2.7 \)  ( )  F. \( \frac{1}{4} = 0.25 \)  ( )

3. Find the values of \( a \), \( b \), and \( c \) if:

A. \( \frac{2}{5} = \frac{a}{15} \)  
B. \( \frac{b}{8} = \frac{15}{24} \)  
C. \( \frac{2}{3} = \frac{16}{c} \)

4. Rearrange the following numbers ascendingly:

A. \( \frac{12}{15}, \frac{12}{7}, \frac{12}{17}, \frac{12}{13}, \frac{12}{15} \)
B. \( \frac{3}{2}, \frac{3}{5}, \frac{3}{8}, \frac{6}{8}, \frac{3}{7} \)
Multiplication

Multiplying fractions and decimal numbers by 10, 100, 1000

Let's work together

Work with your classmate using the calculator:

1. Enter 32.657 on your calculator as illustrated on the opposite figure, then multiply that number by 10. Notice the change of the position of the decimal point within the result.

   ![Calculator input example]

   How many places has the decimal point moved to the right direction?

2. Enter 73.2541 on your calculator, then multiply that number by 100. Notice the change of position of the decimal point within the result.

   ![Calculator input example]

   How many places has the decimal point moved to the right direction?

Think

If we multiply that number by 1000. How many places will the decimal point move to the right direction?

Notice the flow chart illustrating the operations within that lesson:

Key Terms

- Decimal fraction
- Decimal number

You will learn

To multiply fractions and decimal numbers by 10, 100, 1000
Complete:

\[
\begin{align*}
35.321 \times 10 &= \\
27.134 \times 100 &= \\
12.3 \times 1000 &= \\
7.5621 \times 10000 &=
\end{align*}
\]

**Exercises**

1. **Complete:**
   - A. 3.18 \times 10 = ....
   - B. 3.2 \times 10 = ....
   - C. 5.748 \times 100 = ....
   - D. 72.14 \times 100 = ....
   - E. 9.7 \times 100 = ....
   - F. 3.2172 \times 1000 = ....
   - G. 62.819 \times 1000 = ....
   - H. 0.341 \times 1000 = ....
   - I. 7.32 \times 1000 = ....
   - J. (72.12 + 2.7) \times 10 = ....
   - K. (8.35 - 2.14) \times 100 = ....
   - L. (2.35 \times 10) - 11.1 = ....

2. **Choose the correct answer from the parentheses:**
   - A. 98.7 \times 100 = ....
   - B. 0.067 \times 1000 = ....
   - C. 21.3 \times 10 = ....
   - (987 - 9870 - 0.987 - 0.0987)
   - (6.7 - 67 - 0.067 - 670)
   - (2130 - 2.13 - 213 - 0.0213)

3. **Put (<, > or =) in the empty spaces:**
   - A. 4.72 \times 10 = 0.472 \times 100
   - B. 3.251 \times 100 = 325.1 \times 100
   - C. 72.15 \times 10 = 0.07215 \times 1000

4. **Complete:**
   - B. LE 728.9 = .... piasters.
   - C. 37.3 decimeters = .... centimeters.
   - D. 3.6 Kilometers = .... meters
Multiplying a fraction or a decimal number by an integer

Let's work together

The math teacher asked the groups in the class to find the area of a rectangle in which the lengths of its sides are 23.25 cm and 15 cm. Each group drew the rectangle and calculated its area in a different method. Fill in the blanks to find the area.

**The first group**

Area = 23.25 \times 15

= \frac{2325}{100} \times 15

= \_\_\_\_\_\_\_, \_\_\_\_\_\_\_ cm²

**The second group**

Area = 15 \times 23.25

= 15 \times \frac{2325}{100}

= \_\_\_\_\_\_\_, \_\_\_\_\_\_\_ cm²

**The third group:**

Area = 23.25 \times (10 + 5)

= 23.25 \times 10 + 23.25 \times \_\_\_\_\_\_\_, \_\_\_\_\_\_\_ cm²

The teacher said: Despite the difference of the solutions, all the answers are correct.

Explain that by completing the following sentences:

1. 23.25 \times 15 = 15 \times \_\_\_\_\_\_, what do you observe?

2. 23.25 \times (10 + \_\_\_\_\_) = 23.25 \times \_\_\_\_\_\_\_ + 23.25 \times 5, what do you observe?
Find the perimeter of each of the following shapes:

1. If $326 \times 7 = 2282$, $37 \times 52 = 1924$, then complete the following without multiplying:
   - $3.26 \times 7 = \ldots$  
   - $0.0326 \times 7 = \ldots$  
   - $32.6 \times 7 = \ldots$
   - $3.7 \times 52 = \ldots$  
   - $0.37 \times 52 = \ldots$  
   - $0.326 \times 7 = \ldots$
   - $0.0037 \times 52 = \ldots$  
   - $37 \times 5.2 = \ldots$  
   - $0.00326 \times 7 = \ldots$
   - $3.26 \times 17 = 3.26 \times (7 + \ldots) = 3.26 \times 7 + \ldots \times \ldots = \ldots$

2. Find the result of each of the following:
   - $2.37 \times 5 = \ldots$
   - $0.251 \times 9$  
   - $0.819 \times 8$
   - $34.2 \times 7 = \ldots$  
   - $1.352 \times 11$  
   - $2.15 \times 7 + 2.15 \times 3$

3. The price of a bar of chocolate is LE 2.75, what is the cost of 15 bars of the same kind?

4. Ahmed bought 12 cans of juice. The price of each can was LE 1.75. What is the total cost of the juice? How much would the seller pay back to Ahmed if he paid him LE 30?
Multiplying common fractions

Think and discuss

Soad wanted to deduce the product of \( \frac{1}{2} \times \frac{1}{3} \). She used a piece of paper and divided it according to the following steps:

\[
\frac{1}{3} \quad \frac{1}{2} \text{ of } \frac{1}{3} \quad \frac{1}{6}
\]

i.e.: \( \frac{1}{2} \times \frac{1}{3} = \frac{1}{6} \)

Example

Find the product of \( \frac{3}{4} \times \frac{5}{7} \):

\[
\begin{array}{ccc}
\frac{5}{7} & \frac{3}{4} \text{ of } \frac{5}{7} & 15 \frac{28}{28}
\end{array}
\]

i.e.: \( \frac{3}{4} \times \frac{5}{7} = \frac{3 \times 5}{4 \times 7} = \frac{15}{28} \)

In general:

\[
\begin{align*}
\frac{3}{5} \times \frac{3}{8} &= \frac{3 \times 3}{5 \times 8} = \frac{9}{40}, \\
\frac{2}{9} \times \frac{5}{7} &= \frac{10}{63} \text{ and so on...}
\end{align*}
\]
Multiplying decimal fractions

First: Multiplying a decimal fraction by a decimal number

Think and discuss

In the opposite figure:
The length of the rectangle ABCD is 6 tenths and its width is 4 tenths. The area of the rectangle at the figure = The number of square units inside the shape = 24 hundredths

Note that

1. \(0.6 = 6 \text{ tenths}\)
2. \(0.6 = \frac{1}{10} \times 6\)
3. \(0.4 = \frac{1}{10} \times 4\)
4. \(0.6 \times 0.4 = \frac{1}{10} \times 6 \times \frac{1}{10} \times 4 = \frac{1}{100} \times 24\)
5. \(0.6 \times 0.4 = 0.24\)

(1)

The rectangle | length | width | area
--- | --- | --- | ---
ABCD | 0.6 | 0.4 | 0.24
SHAPE (1) | | | \( \frac{1}{10} \times \frac{1}{10} \times 0.1 = 0.05\)
SHAPE (2) | | | \( \frac{1}{10} \times \frac{1}{10} \times 0.3 = 0.03\)

Practice

Find the result of:

\[3.7 \times 0.6 = \frac{37}{10} \times \frac{6}{10} = \frac{222}{100} = 2.22\]

\[0.53 \times 1.29 = 0.6777\]

\[\frac{3}{5} \times \frac{1}{2} = 0.6 \times 0.5 = \frac{3}{5} \times \frac{1}{2} = \frac{3}{5} \times \frac{1}{2} = \frac{3 \times 1}{5 \times 2} = \frac{3}{10} = 0.3\]
Second: Estimating the products of multiplying a fraction, or a decimal number by a fraction or a decimal number.

Example

Find the result: \(7.6 \times 2.2\)

\[
\begin{align*}
7.6 \times 2.2 &= \frac{67}{10} \times \frac{22}{10} \\
&= \frac{1672}{100} \\
&= 16.72
\end{align*}
\]

Numbers can be multiplied as integers, and we find the position of the decimal point in the result.

Practice

1. First: estimate the following products, then compare your estimation to the actual result:

   \[
   \begin{array}{ccc}
   & 5.89 \times 6.1 & \text{Estimated result} & \text{actual result} \\
   A & \ldots & \ldots & \ldots \\
   B & \ldots & \ldots & \ldots \\
   C & \ldots & \ldots & \ldots \\
   \end{array}
   \]

Exercises

1. Find the result:

   \[
   \begin{array}{ccc}
   & 0.12 \times 0.3 & \text{Estimated result} & \text{actual result} \\
   A & \ldots & \ldots & \ldots \\
   B & \ldots & \ldots & \ldots \\
   C & \ldots & \ldots & \ldots \\
   \end{array}
   \]

2. Compare the products of the following by putting < or > or =:

   \[
   \begin{array}{ccc}
   & 7.3 \times 0.28 & 0.73 \times 2.8 \\
   A & \ldots & \ldots & \ldots \\
   B & \ldots & \ldots & \ldots \\
   C & \ldots & \ldots & \ldots \\
   \end{array}
   \]

   \[
   \begin{array}{ccc}
   & 0.342 \times 1.2 & 3.42 \times 0.12 \\
   A & \ldots & \ldots & \ldots \\
   B & \ldots & \ldots & \ldots \\
   C & \ldots & \ldots & \ldots \\
   \end{array}
   \]

   \[
   \begin{array}{ccc}
   & 172 \times 0.003 & 0.172 \times 0.3 \\
   A & \ldots & \ldots & \ldots \\
   B & \ldots & \ldots & \ldots \\
   C & \ldots & \ldots & \ldots \\
   \end{array}
   \]
3. Find the result:

\[
\begin{array}{ccc}
0.67 & \times & 2.8 \\
2.03 & \times & 0.07 \\
9.72 & \times & 0.46 \\
\end{array}
\]

4. Put ( > or < or = ) to make the following sentences true:

A. 12.35 \times 2.5 \quad \square \quad 12.35 \times 0.25
B. 48.2 \times 3.7 \quad \square \quad 4.82 \times 37
C. 4.2 \times 1.53 \quad \square \quad 4.2 \times 15.3
D. 0.206 \times 1.5 \quad \square \quad 2.06 \times 0.3 \times 0.5

5. Find the result:

A. 2.3 \times 7.4 \\
B. 7.4 \times 0.59

Use the resulted products to find the value of:
First: (2.3 \times 7.4) \times 0.59. Second: 2.3 \times (7.4 \times 5.9), what do you observe?

6. Find the results of:

A. 23.17 \times 0.75 = ... \\
B. 1.34 \times 3.2 \\
C. (26.2 \times 4.7) - 3.14 \\
D. (5.32 \times 0.15) + 0.146

7. If the price of one meter of cloth is L.E 6.45, what is the cost of 2.4 meters of cloth?

8. If the price of a can of juice is L.E 19.25. What is the total cost of 25 cans of the same kind?

9. Estimate the products of the following operations, then compare your estimation to the actual result:

A. 5.3 \times 2.7 \\
B. 18.8 \times 7.1 \\
C. 7.82 \times 4.3

10. Salwa bought a piece of cloth with 3.75 meters in length. If the price of one meter of cloth was L.E 33.75, find the cost of cloth approximating it to the nearest pound.
(1) Dividing Fractions

Think and discuss

Samy wanted to find the quotient of dividing \( \frac{1}{4} \) by 3. He used a rectangular piece of paper and divided it into 4 equal parts, then divided the piece of paper into 12 equal parts.

After drawing, Samy noticed that:

\[
\frac{1}{4} + 3 = \frac{1}{12}
\]

Would you agree with Samy? Why?

Note that

\[
\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}
\]

\[
\therefore \quad \frac{1}{4} + 3 = \frac{1}{4} \times \frac{1}{3} = \frac{1}{12}
\]

Example

Divide \( 2 + \frac{2}{3} \)

Divide each unit into 3 equal parts, then construct parts where every part is equal to \( \frac{2}{3} \) unit.

\[
2 + \frac{2}{3} = 3
\]

i.e. 2 + \( \frac{2}{3} \) = \( \frac{3}{2} \) = 3

You will learn

- To divide an integer by a common fraction.
- To divide a common fraction by an integer.
- To divide a common fraction by another common fraction.

Key Terms

- Fraction
- Division
Example

Divide: \( \frac{3}{4} + \frac{1}{4} \)

Result:

\[
\frac{3}{4} + \frac{1}{4} = \frac{3}{4} + \frac{1}{4} = 3
\]

What do you observe?

Think

Can you find the quotient of \( \frac{2}{5} + \frac{3}{5} \)

Practice

1. Find the quotient of:
   - A \( \frac{4}{5} + \frac{1}{2} = \ldots \)
   - B \( \frac{3}{8} + \frac{3}{4} = \ldots \)
   - C \( \frac{1}{2} + \frac{1}{12} = \ldots \)
   - D \( \frac{2}{7} + \frac{5}{7} = \ldots \)

2. Complete:
   - A \( \frac{1}{2} + \frac{3}{4} = \frac{1}{2} + \frac{3}{4} = \frac{3}{2} + \frac{3}{4} = \frac{3}{2} \times \frac{3}{4} = \frac{9}{8} \)
   - B \( \frac{1}{2} + \frac{3}{2} = \frac{1}{2} + \frac{3}{2} = \frac{11}{2} \times \frac{3}{3} = \frac{11}{2} \times \frac{3}{3} = \frac{33}{6} = \frac{11}{2} \)

3. Divide:
   - A \( \frac{3}{4} + \frac{9}{10} \)
   - B \( \frac{2}{5} + \frac{7}{10} \)
   - C \( \frac{1}{2} + \frac{3}{10} \)
   - D \( \frac{9}{10} + \frac{3}{10} \)
   - E \( \frac{7}{10} + \frac{9}{10} \)
   - F \( \frac{4}{10} + \frac{6}{10} \)
(2) Dividing fractions and decimal numbers by 10, 100, 1000

Think and discuss

A charity donor wanted to divide L.E 297.5 by 10 families equally. What is the share of each family?

The share of each family = \(\frac{297.5}{10} = \frac{2975}{100} = \frac{2975}{100} = 29.75\)

What do you observe regarding the number of places moved by the decimal point, and in which direction?

You can also discover the pattern of changing the position of the decimal point to the left while dividing by 10, 100, 1000 using the calculator.

<table>
<thead>
<tr>
<th>Using the calculator</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.57 ÷ 10 = 3.257</td>
<td>(\frac{3257}{100} \times \frac{1}{10} = \frac{3257}{1000} = 3.257)</td>
</tr>
<tr>
<td>95.74 ÷ 100 = 0.9574</td>
<td>(\frac{9574}{100} \times \frac{1}{100} = \frac{9574}{10000} = 0.9574)</td>
</tr>
<tr>
<td>64.39 ÷ 1000 = 0.06439</td>
<td>(\frac{6439}{100} \times \frac{1}{1000} = \frac{6439}{100000} = 0.06439)</td>
</tr>
</tbody>
</table>

Have you observed a specific pattern? What is that pattern?

Saeed said:
When dividing by 10, the decimal point moves one place to the left.
When dividing by 100, the decimal point moves two places to the left.
When dividing by 1000, the decimal point moves three places to the left.
Complete:

- 10

<table>
<thead>
<tr>
<th></th>
<th>43.5</th>
<th></th>
<th>314.6</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6.47</td>
<td>B</td>
<td>6751</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>0.912</td>
<td>E</td>
<td>3.213</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>0.07</td>
<td></td>
<td>0.04617</td>
<td></td>
</tr>
</tbody>
</table>

**Exercises**

1. Complete:
   - A: \(64.43 + 10 = \)
   - B: \(32.57 + 100 = \)
   - C: \(49.21 + 1000 = \)
   - D: \(537.1 + 10 = \)
   - E: \(6.243 + 100 = \)
   - F: \(659.1 + 1000 = \)

2. Choose the correct answer from the parentheses:
   - A: \(1.7 + 10 = \) (17, 0.17, 1.7, 0.017)
   - B: \(75.3 + 100 = \) (753, 7.53, 7530, 0.753)
   - C: \(8.76 + 1000 = \) (87.6, 8.76, 0.00876, 8760)

3. Put the suitable sign (< or > or =) in each of the following:
   - A: \(4.532 + 10 \quad 45.32 + 100\)
   - B: \(3721 + 1000 \quad 0.3721 \times 100\)

4. Complete:
   - A: 3237 grams \(\sim\) kgs.
   - B: 354 meters \(\sim\) cm.
   - C: 325 meters \(\sim\) kilometers.
   - D: 743 mm \(\sim\) cm.
   - E: 54 kilograms \(\sim\) tons.
   - F: 734 cm\(^3\) \(\sim\) liters.

5. A car consumes one liter of gasoline to travel 10 Kilometers. How many liters of gasoline does it need to travel a distance of 534.8 Kilometers?
(3) Dividing an integer by a 3-digit number without having a remainder

Think and discuss
The librarian at the school asked the students to help him arrange the library. He asked them to put 178 books on 7 shelves equally.

Ahmed thought: How many books should we put on every shelf?

Sameir answered: We divide 178 by 7, then the quotient is: 25 books and the remainder is 3 books.

Ahmed said: i.e.,

\[
178 = 7 \times 25 + 3
\]

\[
\begin{array}{ccc}
\text{dividend} & \text{divisor} & \text{quotient} \\
178 & 7 & 25 \\
\end{array}
\]

\[
\begin{array}{ccc}
\text{remainder} \\
3 \\
\end{array}
\]

Note that
The dividend = (the divisor \times the quotient) + the remainder

The remainder is always less than the divisor.

You will learn
\- to divide an integer by a 3-digit number without having a remainder.

Key Terms
\- Remainder.

Practice

<table>
<thead>
<tr>
<th>number of operation</th>
<th>division</th>
<th>dividend</th>
<th>divisor</th>
<th>quotient</th>
<th>remainder</th>
<th>Relation among the elements of division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example</td>
<td>32 + 5</td>
<td>32</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>32 = 5 \times 6 + 2</td>
</tr>
<tr>
<td>1</td>
<td>73 + 8</td>
<td>..........</td>
<td>..........</td>
<td>..........</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>42 + 6</td>
<td>..........</td>
<td>..........</td>
<td>..........</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>..........</td>
<td>..........</td>
<td>14</td>
<td>5</td>
<td>zero</td>
<td>= 9 \times 6 + 8</td>
</tr>
<tr>
<td>4</td>
<td>..........</td>
<td>..........</td>
<td>9</td>
<td>..........</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>92 +</td>
<td>..........</td>
<td>..........</td>
<td>..........</td>
<td></td>
<td>= 9 \times 6 + 2</td>
</tr>
</tbody>
</table>
Note that If the remainder is zero, then the division is without a remainder.

Example
Find the quotient of $3978 \div 234$

Result:

Estimating the quotient to check the reasonability of the answer.

<table>
<thead>
<tr>
<th>Dividend</th>
<th>$3978$</th>
<th>$4000$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisor</td>
<td>$234$</td>
<td>$200$</td>
</tr>
</tbody>
</table>

The reasonable estimation to the quotient is $20$.

Do the division:

The tens digit

$234 \times \ldots < 397 < 234 \times \ldots$

$234 \times 1 < 397 < 234 \times 2$

The units digit:

$234 \times \ldots < 1638 < 234 \times \ldots$

$234 \times 7 = 1638$

$3978 \div 234 = 17$ The quotient is close to the estimation. The answer is reasonable.

Exercises

1. Without doing the division, choose the correct answer from the parentheses:
   - A $11664 \div 216 = \ldots$ (54 - 58 - 62 - 68)
   - B $19708 \div 379 = \ldots$ (48 - 52 - 54 - 62)
   - C $37440 \div 234 = \ldots$ (160 - 170 - 200 - 190)

2. Find the quotient of the following:
   - A $15345 \div 165$
   - B $62160 \div 296$
   - C $11183 \div 211$
   - D $37961 \div 493$

3. The result of multiplying 2 numbers is 9088. If one of them is 284, find the other number.

4. An owner of packing food factories wanted to pack 5904 kilograms of sugar equally in 492 packs. What is the weight of each pack?
(4) Division by a decimal fraction and by a decimal number

First: Division by a decimal fraction without a remainder.

Find the quotient of the following:
First: $0.8 \div 0.2$
Result:

$$0.8 \div 0.2 = \frac{8}{10} \div \frac{2}{10} = \frac{8}{2} = 4$$

Second: $0.75 \div 0.15$
Result:

$$0.75 \div 0.15 = \frac{75}{100} \div \frac{15}{100} = \frac{75}{15} = 5$$

Draw the hundreds chart and illustrate the operation of division on it.

Key Terms
- Infinite division
Example

Find the quotient in each of the following:

A \[ 4.86 \div 0.9 \]
B \[ 4.384 \div 0.32 \]

Result:

A

To find the quotient of \( 4.86 \div 0.9 \) make the divisor an integer by multiplying both of the dividend and the divisor by 10.

\[
\frac{4.86 \times 10}{0.9 \times 10} = \frac{48.6}{9} = 5.4
\]

The quotient is 5.4

B

To convert the divisor into an integer, multiply both the dividend and the divisor by 100.

\[
\frac{4.384 \times 100}{0.32 \times 100} = \frac{438.4}{32} = 13.7
\]

Estimation:

The divided 4.384 → 4
The divisor 0.32 → 0.3
The estimated quotient \( \frac{4 \times 10}{3} \) → 13

Therefore, the answer is acceptable.

Practice

1. Divide 0.1932 + 0.92 and check reasonability of the quotient.

Result:

\[
0.1932 + 0.92 = \frac{0.1932 \times}{0.92 \times} \]

\[
= \frac{92}{92}
\]

= ....
Estimation:
The dividend 0.1932 ÷ 0.2
The divisor 0.92 ÷ ...
The estimated quotient Answer .........

2 Without doing the division, estimate the quotient in each of the following:
A 8.018 ÷ 0.19
B 6.235 ÷ 0.58
Check the reasonability of your estimation using your calculator.

Practice

1 Find the quotient in each of the following:
A 0.416 ÷ 0.8
C 1.155 ÷ 0.35
E 357 ÷ 0.7
B 0.0874 ÷ 0.46
D 36.18 ÷ 0.09
C 0.7595 ÷ 0.31

2 Find the quotient in each of the following:
A (92.36 - 63.25) ÷ 0.41
B (19.645 - 4.73) ÷ 0.38

3 Find a number when multiplied by 0.64, then the result is 075.52

4 Which of the following relations is true and which is false? what do you conclude?
A 3.6 × 1.3 = 1.3 × 3.6
B 0.8 ÷ 0.04 = 0.04 ÷ 0.8

5 A bundle of paper has a height of 4.5 cm. If all its papers were of equal thickness where the thickness of each paper was 0.090 millimeters, find how many papers does the bundle include?
Example

Find the quotient of each of the following:

A. \( 3.375 \div 13.5 \)
B. \( 77.728 \div 6.94 \)

Then discuss the reasonability of your answer.

Result:

A. \( 3.375 \div 13.5 = 33.75 \div 135 \)
   \[
   \begin{array}{c|c}
   \text{3.375} & \hline
   \text{135} & \text{3375} \\
   \text{135} & \text{-27 0} \\
   \hline
   \text{75} & \text{0} \\
   \end{array}
   \]
   \[= 0.25 \]
   \[\text{The estimated quotient is 0.3} \]
   \[\text{The quotient is 0.25} \]
   \[\text{the quotient is close to the estimation. Therefore, the answer is reasonable.}\]

B. \( 77.728 \div 6.94 = 7772.8 \div 694 \)
   \[
   \begin{array}{c|c}
   \text{7772.8} & \hline
   \text{694} & \text{112} \\
   \hline
   \text{694} & \text{-694} \\
   \hline
   \text{832} & \text{1388} \\
   \text{832} & \text{1388} \\
   \hline
   \text{0} & \text{0} \\
   \end{array}
   \]
   \[= 11.2 \]
   \[\text{Estimation:} \quad 7772.8 \rightarrow 80 \]
   \[\rightarrow 7 \rightarrow \frac{80}{7} \rightarrow 11 \]
   \[\text{The quotient is close to the estimation. Therefore, the answer is reasonable.}\]

Practice

1. Convert the following to the decimal forms.

A. \( \frac{3}{4} = \)
B. \( \frac{1}{8} = \)
C. \( \frac{7}{40} = \)
D. \( \frac{4}{25} = \)

3.00
1.00
7.00
2. Complete the following to estimate the quotient in each of the following operations:

- \( \frac{7.56 \times 4.2}{15.7} \)  
  The estimation = \( \frac{8 \times \_}{16} \) = ....

- \( \frac{9.8 \times 9.7}{4.6 \times 4.8} \)  
  The estimation = \( \frac{\_ \times \_}{\_ \times \_} \) = ....

3. Find the quotient of each of the following:

- \( 2.67 \div 1.2 \)
- \( 65.7 \div 6.57 \)
- \( 38.64 \div 8.4 \)
- \( 0.171 \div 1.9 \)
- \( 7.452 \div 621 \)
- \( 21.528 \div 93.6 \)

4. Find the result:

- \( (25.42 \div 3.1) + 1.8 \)
- \( 3.62 - (55.25 \div 32.5) \)

5. The length of a roll of cloth is 53.55 meters. It was divided into equal parts where the length of each part is 3.15 meters. Find the number of these parts.

6. Without doing the mathematical operations, estimate the result of each of the following:

- \( (5.3 \times 11.2) \div 2.1 \)
- \( (20.9 + 7.1) \times 5.2 \)

7. Find the quotient:

- \( 94.5 \div 3.5 \)
- \( 2.64 \div 0.2 \)
Third: Finding the quotient of infinite division to the nearest tenth and nearest hundredth.

Example

Write down each fraction in the decimal form:

A $\frac{3}{8}$

B $\frac{2}{3}$ to the nearest hundredth

Result

A To convert from a common fraction to a decimal fraction:

$$\frac{3}{8}$$

$$\div 3 + 8$$

$$\frac{0.375}{8}$$

Note that the division has no remainder. Therefore, we say the division is finite.

B To find $\frac{2}{3}$ in the form of a decimal fraction:

$$\frac{2 + 3}{0.666}$$

Note that: in that case, the division has a remainder. Therefore, we call it infinite division.

We can continue on division. However, the required is to find the quotient approximated to the nearest hundredth. Therefore, it is enough to divide till we have three decimal digits, then we apply the rules of approximation.

$$\frac{2}{3} \approx 0.67 \text{ to the nearest hundredth.}$$

Practice

Complete:

A $\frac{7}{3} = \ldots$ to the nearest $\frac{1}{10}$

B $\frac{5}{9} = \ldots$ to the nearest $\frac{1}{100}$

C $\frac{3}{11} = \ldots$ to the nearest $\frac{1}{100}$

D $\frac{9}{7} = \ldots$ to the nearest $\frac{1}{10}$
Example
Find the quotient of 546.8 ÷ 53 to the nearest tenth.

Result:

\[
\begin{array}{c|c|c}
546.8 & 500 & 10 \\
53 & 50 & \\
\hline
16 & 00 & 168 \\
0 & & 168 \\
\end{array}
\]

Find the tens digit: \(53 \times 1 < 54 < 53 \times 2\)
Then, write it above the tens digit.

Find the units digit:
Note that 16 < the divisor. Therefore, the units digit = zero.
Place the decimal point in its original position.
Find the tenth digit \(53 \times 3 < 168 < 53 \times 4\)
Then, write it above the tenth digit.

Find the hundredth digit \(53 \times 1 < 90 < 53 \times 2\)
Then, write it above the hundredth digit.

It is enough to divide until you get 2 decimal digits because it is required to approximate the quotient to the nearest tenth.

\[
\therefore \quad 546.8 \div 53 = 10.3 \text{ to the nearest tenth.}
\]

Note that: the estimated quotient is close to the actual quotient.
Therefore, the answer is reasonable.
1. Divide the following then approximate the quotient to the nearest $\frac{1}{10}$
   - A) $53.27 + 2.1$
   - B) $24.31 + 9.07$
   - C) $1.623 + 0.152$
   - D) $12.46 + 0.517$

2. Find the results and approximate them to the nearest hundredth.
   - A) $7.034 + 1.7$
   - B) $1.775 \times 0.15$
   - C) $(3.425 + 1.07) + 2.8$
   - D) $7.52 + (14.73 - 11.58)$

3. Place a suitable sign ($>$, $<$ or $=$):
   - A) $0.46 \div 4.6$
   - B) $17.17 \times 1.7$
   - C) $53.7 \div 3.5$
   - D) $845 \div 4.9$
   - E) $5.37 + 0.35$
   - F) $(84.5 + 49) \times 0.1$

4. Find the quotient in each of the following:
   - A) $9.568 + 9 \frac{1}{5}$
   - B) $2 - \frac{1}{8} + 0.125$
   - C) $2 \frac{3}{25} + 0.012$
   - D) $17 \frac{1}{40} - 0.85$

5. The area of a rectangle is 9.43cm², and its width is 2.45cm. Find its length and approximate it to the nearest hundredth of centimeter.

6. Fill in the blanks:
   - A) $4.25 + \ldots = 8 \frac{1}{2}$
   - B) $\ldots + 9 = 4.5$
7. Find the quotient of $458.62 \div 35.2$ to the nearest hundredth.

8. Divide 375 by 0.5 then add $5 \frac{1}{4}$ to the quotient.

9. The area of a rectangle is 10.25 square meters, and its length is 4.1 meters. Find its width and perimeter.

10. The side length of a square is 5.06 meters. Find its area approximating it to the nearest hundredth.
How do you deal with Excel?
Click the start menu, then choose programs. On programs click on office, then choose Excel (the spread sheets). A table will appear on the monitor, it is divided into rows and columns. Each space within the table is called a cell. For example, $B_2$ denotes the element located in row number 2 and column B while cell $D_4$ denotes the element located in the row number 4 and the column D.

**Example:** Use the spread sheets program (Excel) to find the quotient of $0.75 + \frac{7}{8}$.

1. Enter the number 0.75 in cell $A_1$, then enter the number 7 in cell $C_1$ and 8 in cell $D_1$.
2. Do a mouse click on cell $G_1$ and write $\div$ then click on $C_1/D_1$ and press Enter.
3. Do a mouse click on cell $I_1$ and write $\times$ then click on $A_1/G_1$ and press Enter. The quotient appears.

**Find by yourself:**

$$0.75 \times \frac{7}{8}$$

(Note that the multiplication symbol is (*) and division symbol is (/)).

To find the sum of $0.75 + \frac{7}{8}$,

Do a mouse click on cell $K_1$ and write $\div$ then write $A_1 + G_1$ and press Enter. The quotient appears.
Giza pyramids were built more than 5000 years BC. Khufu pyramid is the largest one as it has a height of 146 meters, where the base area is as equal as the area of 10 football playgrounds.

1. Each stone used in building the pyramid weighs about 3.2 tons. What is the weight of 108 stones in kilograms?

2. Some huge stones used in building the pyramid weigh 15.3 tons each. If an elephant weighs 3 tons, what is the number of elephants which the total of their weight is equal to the weight of one stone?

3. If the process of glazing each stone in a pyramid takes 25 minutes. Will the process of glazing 8 stones take 3 hours? Explain.

Use the knowledge resources (i.e., library, Internet, ...) to write a ten-line paragraph about Giza pyramids.
1. Find the results of each of the following operations approximating them to the nearest hundredth.
   -\( 65.384 + 63.427 \)
   -\( 729.72 - 122.743 \)
   -\( 75.32489 \times 100 \)
   -\( 26.4392 \div 10 \)

2. A truck can hold 125 boxes of oranges at a time. How many times are needed to deliver 4375 boxes by that truck?

3. Which is greater, \( \frac{5}{8} \) or 0.5734? Find the difference between the two fractions.

4. Find a number that if multiplied by 0.37, then the result is 17.8932.

5. Rearrange the following fractions descendingly: \( \frac{1}{2}, 0.8, \frac{1}{4}, 0.3 \)

6. The length of a rectangle is 25.4cm while its width is 18.09cm. Find its perimeter and its area.
unit 2

Sets

C
n
U
What is a set?

1. What are the days of the week? The days of the week are: Saturday, Sunday, Monday, Tuesday, Wednesday, Thursday and Friday.

2. What are the letters of the word "Hosam"? The letters of the word Hosam are: H, O, S, A, M.

3. What are the digits of the number 71536? The digits of the number 71536 are: 7, 1, 5, 3, 6.

All of the above collections are called "A set" So, we say:

The set of the days of the week, the set of the letters of the word "Hosam" and the set of the digits of the number 71536.

**The set:** it is a collection of known objects that are clearly defined, and they have a certain property in common.

**Note that:** The beautiful flowers in your school garden do not form a set since the property of beauty differs from a person to another.

The set of the letters forming the word "Magdy" are: M, A, G, D, Y. Each letter is called an element of the elements in the set of the letters forming the word Magdy.

**Practice**

1. The set of the colors that appear in the traffic signal has the following elements: Red, ... and ...
2. Complete: In the following figure, the set of the means of transportation has the following elements: the plane, the train, _______ and _______.

1. Complete the following table as illustrated in the example:

<table>
<thead>
<tr>
<th>The expression</th>
<th>A set/not a set</th>
</tr>
</thead>
<tbody>
<tr>
<td>The months of the Hegri year.</td>
<td>a set</td>
</tr>
<tr>
<td>The tall students in your class.</td>
<td>Not a set</td>
</tr>
<tr>
<td>The seasons of the year.</td>
<td></td>
</tr>
<tr>
<td>The letters of the word &quot;Egypt&quot;</td>
<td></td>
</tr>
<tr>
<td>The beautiful stories</td>
<td></td>
</tr>
<tr>
<td>The prime numbers between 5 and 25</td>
<td></td>
</tr>
</tbody>
</table>

2. Write down all the elements in the following sets:

<table>
<thead>
<tr>
<th>THE SET</th>
<th>THE ELEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The set of the digits in the number 3072</td>
<td></td>
</tr>
<tr>
<td>The set of the colors in Egypt’s flag</td>
<td></td>
</tr>
<tr>
<td>The set of the days in the week</td>
<td></td>
</tr>
<tr>
<td>The set of the year’s months that have less than 30 days.</td>
<td></td>
</tr>
<tr>
<td>The set of 2-digit numbers and each is like the other.</td>
<td></td>
</tr>
<tr>
<td>The set of the months in the Hegri year.</td>
<td></td>
</tr>
</tbody>
</table>
**Mathematical expression of a set**

**First: The listing method**

To express a set, write all the elements of the set between two braces \(\{\ldots\}\), then place the mark ",," between every two elements. The set is symbolized by one of the alphabetic letters written in capital font like: \(X, Y, Z, \ldots\).

**Examples**

1. Write down the set \(X\) where \(X\) is the set of the letters forming the word (Ahmed).
   **Solution:**
   \[X = \{a, h, m, e, d\}\]. It can be written also as:
   \[X = \{h, d, a, e, m\}\]

2. Write down the set \(Y\) where \(Y\) is the set of the digits in the number 1717.
   **Solution:**
   \[Y = \{7, 1\}\]. It can be written also as: \(Y = \{1, \ldots\}\)

**Note that**

It is not important to pay attention to the order of the elements when writing a set.

- Any set does not have a repeated element.
- In the opposite figure, the ordered pair \((2, 5)\) is different from the ordered pair \((5, 2)\) while the set \(\{2, 5\}\) is the same as the set \(\{5, 2\}\).
**Second: The description method**

In that method, we define the property which distinguishes and determines the elements of a set.

**For example,** the set: \{c, a, r, e\} can be expressed as follows: The set of the letters forming the word care, or the set of the letters forming the word (race), or the set of the letters forming the word (acre).

It can be written in the following form: \{x : x is one of the letters forming the word care\}, and it is read as the set of all x where x is one of the letters forming the word care.

---

**Think**

Write down the set X where \(x = \{2, 3, 5, 7, 11, \ldots\}\). Use the description method.

---

**Practice**

Complete the table to express the following sets:

<table>
<thead>
<tr>
<th>THE LISTING METHOD</th>
<th>THE DESCRIPTION METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>{c, a, r}</td>
<td>The set of the letters forming the word car</td>
</tr>
<tr>
<td>{east, west, north, south}</td>
<td>The set of the colors forming Egypt's flag</td>
</tr>
<tr>
<td>{                                              }</td>
<td>The set of the digits in the number 46421.</td>
</tr>
<tr>
<td>{Abo Bakr, Omar, Othman, Ali}</td>
<td>The set of the letters of the word (Series)</td>
</tr>
<tr>
<td>{2, 4, 6, 8, 10}</td>
<td></td>
</tr>
<tr>
<td>{1, 3, 5, 7, }</td>
<td></td>
</tr>
<tr>
<td>{0, 2, 4, 6, 8, }</td>
<td></td>
</tr>
</tbody>
</table>
Scientists Jan Venn could represent every element in a set by placing a point or an \((x)\) mark in any closed geometric shape such as (a triangle, a circle, a rectangle, ... etc).

For example: The set \(X = \{2, 3, 5, 9\}\) can be represented by using a Venn diagram as follows:

![Venn Diagram Example](image)

---

**Practice**

Complete the following table:

<table>
<thead>
<tr>
<th>The set</th>
<th>Venn diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X = {2, 5, 8})</td>
<td><img src="image" alt="Venn Diagram" /></td>
</tr>
<tr>
<td>The listing method (Y = {\  })</td>
<td><img src="image" alt="Venn Diagram" /></td>
</tr>
<tr>
<td>The description method is</td>
<td><img src="image" alt="Venn Diagram" /></td>
</tr>
<tr>
<td>(Z = ) the set of the letters forming the word (Stairs)</td>
<td><img src="image" alt="Venn Diagram" /></td>
</tr>
<tr>
<td>(X = {\  })</td>
<td><img src="image" alt="Venn Diagram" /></td>
</tr>
<tr>
<td>(Y = )</td>
<td><img src="image" alt="Venn Diagram" /></td>
</tr>
<tr>
<td>The set of the elements found in (X) and (Y) is</td>
<td><img src="image" alt="Venn Diagram" /></td>
</tr>
</tbody>
</table>
Belonging of an element to a set

Think and discuss

If the football team of your class consists of Samy, Hatem, Khaled, Yasser, Hany and Maher. Write down the set \( X \) which represents the football team of your class.

\[ X = \{ \ldots \} \]

1. Is Khaled one of the players of the football team of your class?

2. Is Khaled an element of the elements of the football team in your class? We can say that Khaled belongs to the set of the football team in your class.

This can be symbolized as follows: \( \text{Khaled} \in X \)

Similarly, \( \text{Samy} \in X \), \( \text{Hatem} \in X \), ... and so on.

The symbol \( \in \) denotes "the belonging of an element to a set"

Note that

Ahmed is not a player in that team so, Ahmed does not belong to \( X \), This is symbolized as \( \text{Ahmed} \notin X \).

The symbol \( \notin \) denotes "The not belonging of an element to a set"

Example: If \( Y = \{4, 5, 7, 9, 11\} \),

Then \( 4 \in Y \), \( 5 \in Y \) and \( 11 \in Y \),

while \( 8 \notin Y \) and \( 12 \notin Y \).

Think

If \( 3 \in \{2, x\} \) Then \( x = \ldots \)
1. Write each of the following sentences using one of the symbols $\in$ or $\notin$.

<table>
<thead>
<tr>
<th>The sentence</th>
<th>The symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 is an element of the set X</td>
<td>$6 \in X$</td>
</tr>
<tr>
<td>5 belongs to the set Y</td>
<td></td>
</tr>
<tr>
<td>B does not belong to the set M</td>
<td></td>
</tr>
<tr>
<td>7 does not belong to the set N</td>
<td></td>
</tr>
<tr>
<td>B is an element of the set K</td>
<td></td>
</tr>
</tbody>
</table>

2. If $X$ is a set where $X = \{2, 3, 5, 6\}$
   Place the suitable symbol $\in$ or $\notin$ in the blanks to make each sentence true:

   A. $3 \_ X$
   B. $5 \_ X$
   C. $7 \_ X$
   D. $6 \_ X$
   E. $0 \_ X$
   F. $2 \_ X$
   G. $1 \_ X$
   H. $32 \_ X$

3. Place the suitable symbol $\in$ or $\notin$ in the blanks to make each sentence true:
   A. $2 \_ \{3, 1, 7\}$
   B. $Y \_ \text{the set of the letters forming the letters of the word Egypt}$
   C. $3 \_ \text{The set of the odd numbers}$
   D. $7 \_ \text{the set of the days of the week}$
   E. $3 \_ \{13, 33, 330\}$

4. Fill in using a suitable number:
   A. If $4 \in \{2, x, 5\}$ Then $x = \_\_\_$
   B. If $5 \in \{7, 9, x\}$ Then $x = \_\_\_$
   C. If $5 \in \{3, 4 + x\}$ Then $x = \_\_\_$
   D. $x \in \{3, 5, 10\}$ and belongs also to the set of the prime factors of the number 6.
Types of sets

Think and discuss

How many elements are there in the set $X = \{a, h, m, e, d\}$?
The number of the elements in the set $X = \underline{5}$.
So, we call that set a finite set.

**The finite set**

It is a set that has a limited number of elements.
i.e., the number of its elements can be listed.

Similarly, the set $X = \{g, b, r\}$ is a finite set that has three elements.
The set $Y = \{\text{the set of the days of the week}\}$ is also a finite set that has 7 elements.

**The infinite set**

It is a set that has an unlimited number of elements i.e., the number of its elements cannot be listed.

For example: The set of the even numbers $\{0, 2, 4, 6, \ldots\}$ is an infinite set because the number of its elements cannot be listed.

Similarly, The set of the decimal numbers between 2 and 3 is an infinite set where some of its elements are $2.1, 2.534, 2.91, \ldots$.

**The null set**

It is a set that has no elements. It is denoted by the symbols $\{\}$ or $\emptyset$ and read as (Fai).

For example: The set of the students in your class that are 30 years old or the set of the months in a year that have 35 days.
Note that

The **null set** is a **finite set** in which the number of its elements = zero.

The set \( \{ \} \) has a number of elements that is equal to zero, while the set \( \{0\} \) has a number of elements that is equal to 1 and it is not a null set.

**Exercises**

1. Which of these sets is a finite set and which of them is an infinite set. Write the elements of every finite set:

<table>
<thead>
<tr>
<th>The set</th>
<th>finite</th>
<th>Number of elements</th>
<th>Infinite</th>
</tr>
</thead>
<tbody>
<tr>
<td>The set of the days in a week</td>
<td>✅</td>
<td>7</td>
<td>✗</td>
</tr>
<tr>
<td>The set of the months in a gregorian year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The set of the odd numbers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The set of the prime numbers less than 20.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The set of the letters forming the word (sondos).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The set of the factors of the number 3.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The set of the alphabets in the English language.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Which of these sets is a null set and which of them is not a null set:

A. The set of students in your class who made a trip to the moon. (   )
B. The set of the Egyptian governorates in Asia. (   )
C. The set of those numbers divisible by 7 and are between 8, 15. (   )
D. The set of the factors of 15 which are divisible by 2. (   )
E. The set of those numbers divisible by 5 and are between 5, 10. (   )
F. The set of the governorates in upper Egypt that are located on the Mediterranean sea. (   )
Equal sets

Think and discuss

Complete: The set of the letters forming the word (Magd) are......
The set of the letters forming the word (Gmad) are ...........
What do you observe?
If the set \( X = \{2, 3, 7\} \) and the set \( Y = \{7, 3, 2\} \) What do you observe in those two sets?
Note: Do not pay attention to the order of the elements in a set.
We observe that the elements of the set \( X \) are the same elements in the set \( Y \)

The set \( X = \) The set \( Y \)
If the two sets have the same elements exactly

Practice

If \( X \) is the set of the letters forming the word (month) while, \( Y \) is the set of the letters forming the word (months). Are the two sets equal? State the reason.

Example

Find the values of \( a \) and \( b \) that make each sentence true.

1. \( \{a, 7\} = \{b, 2\} \)
2. \( \{5, a, 8\} = \{b, 9, 8\} \)
3. \( \{3, 6, a\} = \{6, 3, 4\} \)

Solution:

1. \( \{a, 7\} = \{b, 2\} \) \hspace{1cm} when \( a = 2, b = 7 \)
2. \( \{5, a, 8\} = \{b, 9, 8\} \) \hspace{1cm} when \( a = 9, b = 5 \)
3. \( \{3, 6, a\} = \{6, 3, 4\} \) \hspace{1cm} then \( a = 4 \)
Exercises

1. Put (√) for the true sentence and (×) for the false one:
   - A. \{1, 2, 5\} = \{21, 5\}
   - B. \{a, r, c\} = the set of the letters forming the word (car)
   - C. \{1, 2, 3, 6\} = the factors of the number 6.
   - D. \{x, 2, 5\} = \{2, 5, 3\} where x = 3.

2. If \(X =\) the set of the letters forming the word (lab), \(Y =\) the set of the letters forming the word (ball), is \(X = Y\)?

3. If \(\{x, 2, 7\} =\) the set of the digits in the number 2257, find the value of \(x\).

4. Match the equal sets in the following columns:
   - \{6, 8, 9\}
   - \{10, 12, 14, ..., 98\}
   - \{3, 6\}
   - \{z, i, e, w, l\}
   - the set of the seasons of the year.
   - \(∅\)
   - the set of the letters forming the word (ziwei)
   - the set of the digits of 9688
   - \{Summer, winter, spring, autumn\}
   - the set of the months in a year that have 35 days
   - \{d, 3\}
   - the set of the even numbers that have 2 digits.

5. Place (√) for the true sentence and (×) for the false sentence:
   - A. \(\{0, 2, 4, 6\} =\) the set of the even numbers less than 6.
   - B. \(\{77, 99\} =\) the set of the digits of 9977.
   - C. \(\{3, 6, 9, ...\} =\) the set of the counting numbers that are divisible by 3.
Inclusion and subsets

Think and discuss

If X = the set of the letters forming the word (pie) and Y = the set of the letters forming the word (pier).

Write each of the two sets using the listing method.

X = \{p, i, e\}, while Y = \{p, i, e, r\}

Are all the elements of the set X found in the set Y? Draw a Venn diagram which represents the two sets X and Y.

Yes, all the elements of the set X are found in the set Y.

So, we say:

\[
X \text{ is a subset of } Y, \\
\text{(or) } X \text{ is included in } Y
\]

This is denoted by: \( X \subseteq Y \)

The symbol \( \subseteq \) denotes the inclusion of one set in another set.

If X = \{1, 2\}, Y = \{2, 3, 4, 5\}. Is \( X \subseteq Y \)?

we note that: \( 1 \in X \) while \( 1 \notin Y \)

Therefore, X is not a subset of Y because all the elements in X are not included in Y, so we say that X is not a subset of Y:

\[
X \text{ is not included in } Y
\]

and that is written as \( X \nsubseteq Y \)

where the symbol \( \nsubseteq \) denotes the non inclusion of a set in another set.
Examples

1. Fill in the blanks using one of the two symbols \( \subset \) or \( \subseteq \) to make each sentence true:
   - A \{1, 2\} \( \subset \) \{1, 2, 3\}
   - B \{7\} \( \subseteq \) \{77\}
   - C \{7, 8\} \( \subseteq \) \{7, 9, 11\}
   - D \{2\} \( \subset \) \{2\}

Solution:
   - A \{1, 2\} \( \subset \) \{1, 2, 3\}
   - B \{7\} \( \subseteq \) \{77\} as the first set has only one element which is 7 while the second set has only one element which is 77.
   - C \{7, 8\} \( \subseteq \) \{7, 9, 11\} because 8 \( \in \) \{7, 8\} while 8 \( \notin \) \{7, 9, 11\}
   - D \{2\} \( \subset \) \{2\} i.e., any set \( X \) is a subset of itself \( X \subseteq X \)

2. In the opposite Venn diagram:
   - Write \( X, Y \) and \( Z \), using the listing method, what do you observe?

Solution:
   - \( X = \{1, 3, 9\}, Y = \{2, 4, 7\} \) and \( Z = \{1, 9, 3, 2, 5\} \)

Note that
   - \( X \subseteq Z \) while \( Y \not\subseteq Z \)
   - The symbols \( \subset \) and \( \subseteq \) refer to the relation between a set and another set while the symbols \( \in \) and \( \notin \) refer to the relation between an element and a set.
   - The null set is a subset of any set i.e., \( \varnothing \subseteq X, \varnothing \subseteq Y \) and \( \varnothing \subseteq Z \)

3. Write down all the subsets of \( X = \{1, 2, 3\} \):

Solution: the subsets are:
   - The null set \( \varnothing \).
   - The sets which have one element each: \( \{1\}, \{2\} \) and \( \{3\} \).
   - The sets which have 2 elements each: \( \{1, 2\}, \{1, 3\} \) and \( \{2, 3\} \).
   - The sets which have 3 elements each: \( \{1, 2, 3\} \)

4. Write down all the subsets in each of the following sets:
   - A \( X = \{3\} \)
   - B \( Y = \{5, 6\} \)

Solution:
   - A The subsets of the set \( X \) are: \( \varnothing \) and \( \{3\} \)
   - B The subsets of the set \( Y \) are: \( \varnothing \), \( \{5\}, \{6\} \) and \( \{5, 6\} \)
1. Complete the table:

<table>
<thead>
<tr>
<th>Set X</th>
<th>Set Y</th>
<th>Use ⊆ or ⊈</th>
</tr>
</thead>
<tbody>
<tr>
<td>{7, 9, 10}</td>
<td>{6, 7, 8, 9, 10}</td>
<td>X</td>
</tr>
<tr>
<td>{a, b, c}</td>
<td>{a, b, d, e}</td>
<td>X</td>
</tr>
<tr>
<td>{1, 2, 3}</td>
<td>The set of the prime numbers</td>
<td>X</td>
</tr>
<tr>
<td>The letters of (Ragb)</td>
<td>the letters of (Gabr)</td>
<td>X</td>
</tr>
<tr>
<td>{January, March}</td>
<td>The months of the gregorian year</td>
<td>X</td>
</tr>
<tr>
<td>{London}</td>
<td>The set of the capitals of all the world's countries</td>
<td>X</td>
</tr>
</tbody>
</table>

2. Look at the opposite Venn diagram, then complete the following using one of the symbols ⊆, ⊈, ∈ or ∉:

   A. y ⊆ X
   B. 2 ⊈ X
   C. {5} ∈ Y
   D. 6 ⊈ Y
   E. 4 ⊆ X
   F. {6, 8} ⊆ X

3. Find the subsets for each of the following sets:

   A. {8}
   B. {∅}
   C. {3, 5, 9}
   D. {99}
   E. The set of the letters forming the word (bibli).

4. State whether each sentence is true or false:

   A. {0} ⊆ {100}
   B. {100} ⊈ {0, 10}
   C. ∅ ⊆ {0}
   D. 9 ∈ {99}
**You will learn**

To find the intersection of two sets.

**Key Terms**

Intersection of two sets (∩)

---

**Think and discuss**

Look at the opposite Venn diagram and complete

\[ X = \{ \quad \} \]

\[ Y = \{ \quad \} \]

Are there any common elements in the sets \(X\) and \(Y\)? What are they?

Yes, there are common elements in the two sets \(X\) and \(Y\) where

\[ 3 \in X, \quad 3 \in Y, \quad \text{similarly} \quad 8 \in X \quad \text{and} \quad 8 \in Y \]

i.e., each of the two elements 3 and 8 belong to the two sets \(X\) and \(Y\).

Therefore, \(\{3, 8\}\) is the set of the intersection of the two sets \(X\) and \(Y\). This relation is written as \(X \cap Y = \{3, 8\}\)

**The intersection of two sets** = the set of all common elements in the sets \(X\) and \(Y\)

In the above Venn diagram that represents the two sets,

\(X \cap Y\) is represented by the colored section.

**Examples**

1. If \(X = \{1, 2, 3, 4, 5\}\),
   \(Y = \{\text{the set of the digits of 6315}\}\)

   Represent the two sets \(X\) and \(Y\) by a Venn diagram, then find: \(X \cap Y\) and \(Y \cap X\), what do you observe?
Solution:
\[ X = \{1, 2, 3, 4, 5\} \quad Y = \{5, 1, 3, 6\} \]
\[ X \cap Y = \{1, 3, 5\} \]
\[ Y \cap X = \{1, 3, 5\} \]

From the above, we notice that:
\[ X \cap Y = Y \cap X \]
(The commutative property)

2. Use a Venn diagram to represent the two sets: \( X = \{a, b, e\} \), \( Y = \) the set of the letters forming the word (fig) then find: \( X \cap Y \) and \( Y \cap X \)

Solution:
We notice that there are not common elements in \( x \) and \( Y \) so, we say \( X \) and \( Y \) are two disjoint sets, then \( X \cap Y = \emptyset \) \( Y \cap X = \emptyset \)

Think:
If \( X = \{1, 2, 3\} \) find \( X \cap \emptyset \).

Exercises

1. In the opposite Venn diagram:
   A. Color \( X \cap Y \) in red.
   B. Color \( X \cap Z \) in green.
   C. Color \( Y \cap Z \) in yellow.
   D. Find: \( (X \cap Y) \cap Z \) and \( X \cap (Y \cap Z) \), what do you observe?

2. Complete:
   A. \( \{5, 6\} \cap \{4, 5\} = \)
   B. \( \{1, 2, 9\} \cap \{1, 2, 4, 9\} = \)
   C. \( \{1, 7, 14\} \cap \{2, 14, 1\} = \)
   D. \( \{3, 2, 5\} \cap \{4, 23, 55\} = \)
3. Complete:

\[X \cap Y = \ldots\]

4. Look at the opposite Venn diagram and write down \(X, Y\) and \(Z\) using the listing method, then find the following:

- A. \(X \cap Y = \ldots\)
- B. \(X \cap Z = \ldots\)
- C. \(Y \cap Z = \ldots\)
- D. \(\{5, 6, 7, 8\} \cap Z = \ldots\)
- E. \(\{3, 2\} \cap X = \ldots\)
- F. \(\{2, 5, 8\} \cap Y = \ldots\)

5. Place the suitable symbol \(\in, \not\in, \subset\) or \(\subsetneq\) to make each of the following sentences true:

- A. If \(X = \{1, 2, 3\} \cap \{2, 4, 6\}\) then \(3 \ldots \ldots X\)
- B. If \(Y = \{2, 3, 5\} \cap \{1, 3, 5\}\) then \(1, 2, 3, 5 \ldots \ldots Y\)
- C. If \(Z = \{3, 4, 5\} \cap \{2, 3, 4\}\) then \(4 \ldots \ldots Z\)
- D. If \(R = \{2, 5, 6\} \cap \{3, 5\}\) then \(R \ldots \ldots \{2, 5\}\)
- E. If \(M = \{5, 2, 3\} \cap \{1, 5\}\) then \(M \ldots \ldots \{2\}\)

6. If \(X = \{1, 2, 3\}, Y = \{2, 3, 5, 6\}\) and \(Z = \{1, 2, 5\}\). Represent each of \(X, Y\) and \(Z\) using a Venn diagram, then find the following:

**First:** \((X \cap Y) \cap Z\)

**Second:** \(X \cap (Y \cap Z)\)

What do you observe?
Union of two sets

Think and discuss

Look at the opposite Venn diagram and complete:

X = { ___________ } 

Y = { ___________ } 

The set that has all the elements in X or Y or in X and in Y is = { ... } 

The union of the two sets X and Y is represented by the colored section in Venn diagram. This relation can be written as:

\[ X \cup Y \]

The colored section represents the set which includes all the elements in X or Y or both of them.

The set of elements which belong to x or to Y is called the union of the two sets X and Y. It is written as:

\[ X \cup Y = \{1, 2, 3, 4, 5, 7, 9\} \]

Example

Find each of \( X \cup Y \) and \( X \cap Y \) in the following cases:

\[
\begin{align*}
X \cup Y &= \{2, 7, 3, 1\} \\
X \cap Y &= \{3\}
\end{align*}
\]

\[
\begin{align*}
X \cup Y &= \{1, 2, 5, 3, 4\} \\
X \cap Y &= \emptyset
\end{align*}
\]

Key Terms

- Union of two sets (\( \cup \) )

Notice that \( Y \subset X \)
Given that \( X = \{1, 2, 3, 4\} \) and \( Y = \{4, 5, 6\} \). Find \( X \cup X \cup \emptyset \), \( X \cup Y \) and \( Y \cup X \). What do you observe?

**Exercises**

1. **Complete:**
   - **A** \( \{2\} \cup \{4\} = \_______ \)
   - **B** \( \{1, 5\} \cup \{1, 3\} = \_______ \)
   - **C** \( \{1, 2, 12\} \cup \{2, 3, 12\} = \_______ \)
   - **D** \( \{1, 4, 6\} \cup \emptyset = \_______ \)

2. **Look at the opposite Venn diagram, then find**
   \( X \cup Y \) and \( Y \cup X \). What do you observe?

3. **Given that** \( X = \{1, 2, 3\} \), \( Y = \{2, 3, 5, 6\} \) and \( Z = \{1, 2, 5\} \). Find each of: \( (X \cup Y) \cup Z \) and \( X \cup (Y \cup Z) \). What do you observe?

4. **In each of the following Venn diagrams, write what the colored section represents:**

   - ![Diagram 1](image1)
   - ![Diagram 2](image2)
   - ![Diagram 3](image3)
   - ![Diagram 4](image4)
   - ![Diagram 5](image5)
   - ![Diagram 6](image6)
The Universal set

Think and discuss

If \( x = \) The set of the football team in your class.
\( Y = \) The set of the basketball team in your class.
Then, we can choose a huge set that represents all the given sets in the problem where the given sets are subsets of it.
That huge set is called the universal set and it is denoted by the symbol \( U \).

Example: The universal set can be the set of the students in your class or the set of all the students in the fifth grade in the school or simply the set of all the students in the school.

The universal set \( (U) \) is the mother set which includes all the given subsets.

The universal set may be represented by a rectangle on the Venn diagram while its subsets are represented by closed Curves inside the rectangle.

Examples

1. \( X = \{\text{Egypt, Libya, Sudan}\} \),
\( Y = \{\text{Sudan, Somalia}\} \)
\( U \) is possibly the set of Arab countries.

Think of another description for the universal set \( U \).
2. If \( X = \{5, 7, 9, 11, \ldots\} \).

   \( U \) is possibly the set of the odd numbers.

   Think of another description of \( U \).

---

**Exercises**

The given sets in each of the following cases represent subsets, write down a suitable universal set for each case:

1. \( X = \{\text{Cairo, Helwan, 6th of October city}\} \),
   \( Y = \{\text{Sharqya, Alexandria}\} \)
   \( U = \) __________

2. \( X = \text{The set of Math teachers at your school} \),
   \( Y = \text{the set of science teachers at your school} \)
   \( U = \) __________

3. \( X = \{2, 5, 8\} \),
   \( Y = \{2, 3, 7, 8\} \)
   \( U = \) __________ (represent \( U \) by Venn diagram)

4. \( X = \{\text{Taha Houssen, Youssef Idrees, Tawfik Al-Hakeem}\} \)
   \( U = \) __________

5. The opposite Venn diagram represents the two sets \( L, M \) and the universal set \( U \). If we give each different section within the Venn diagram one of the following numbers: 1, 2, 3, 4. Can you represent the following sections using the two sets \( L, M \) and the symbols \( n \) and \( u \).
   
   - A Section 1
   - B Sections 2, 1 and 3
   - C Sections 1 and 3
   - D Sections 2 and 1

---

Mathematics - Fifth Primary

62
The Complement of a set

Think and discuss

1. If the set of the music team at school is:
   \[ U = \{ \text{Magdy, Yasser, Fayez, Lila, Souad} \} \]

   Then, the set of boys in the team \( x \).

   \[ X = \{ \text{Magdy, Yasser, Fayez} \} \]

   **Note that** \( X \subset U \)

   However, if the set of the girls is \( x' \), then:

   \[ X' = \{ \text{Lila, Souad} \} \]

   Therefore, the set \( x' \) is the complement of the set \( x \).

   Complete \( X \cup X' = \ldots \), \( X \cap X' = \ldots \).

2. If the universal set
   \[ U = \{1, 2, 3, 5, 6, 8, 9\} \]

   and the set \( A = \{2, 5, 8\} \)

   where \( A \subset U \)

   Then, we call the set \( \{1, 3, 6, 9\} \) The complement of the set \( A \) with regard to the set \( U \). That set is written as \( A' = \{1, 3, 6, 9\} \) and it is defined as a set of the elements in \( U \) that does not belong to the set \( A \). It is denoted by the symbol \( A' \) and written as \( A' = \{1, 3, 6, 9\} \).

   The complement of a set \( A \) with regard to the set \( U \) is

   \[ A' \text{ where: } A \cup A' = U \, , \, A \cap A' = \emptyset \]
Exercises

1. Look at the opposite Venn diagram then complete:
   \[ U = \ldots \quad A = \ldots \quad A' = \ldots \]

2. Look at the opposite Venn diagram then complete:
   \[ U = \ldots \quad X = \ldots \]
   \[ X' = \ldots \quad X \cap X' = \ldots \]
   \[ X \cup X' = \ldots \]

3. Look at the opposite Venn diagram then complete:
   \[ U = \ldots \quad X = \ldots \]
   \[ Y = \ldots \quad X' = \ldots \]
   \[ Y' = \ldots \quad Y \cup X = \ldots \]
   \[ Y \cap X = \ldots \quad (Y \cup X)' = \ldots \]

4. If \( U \) is the set of the even numbers less than 16, \( A = \{ 4, 6, 10, 12 \} \) and \( B = \{ 2, 6, 8, 14 \} \). Find each of the following: \( A \cup B \), \( (A \cup B)' \), \( A \cap B \) and \( (A \cap B)' \).

5. If \( U \) is the set of the factors of 12 and \( A \) is the set of the factors 6. find \( A' \).

6. If \( U = \{ 1, 2, 3, 4, 5, 6 \} \), \( X = \{ 3, 4, 5 \} \) and \( Y = \{ 1, 2, 3 \} \).

Find each of the following sets:
- \( A \cap X' \)
- \( B \cap Y' \)
- \( C \cap X \cap Y \)
- \( D \cap (X \cap Y)' \)
- \( E \cap X \cup Y \)
- \( F \cap (X \cup Y)' \)
- \( G \cap X' \cup Y' \)
- \( H \cap X' \cap Y' \)
The Difference of two sets

Think and discuss

A survey has been applied on 10 students from class 5/1 showed that only 4 students read Al-Gomhoria newspaper. Those students are Ahmad, Sameh, Hanay, and Hanaa. However, only 3 students read Al-Akhbar newspaper. Those students are: Rana, Hossam, and Hany while two students read both the newspapers; Mona and Mahmoud, and only one student does not read any newspaper: Samir. This can be illustrated using the opposite Venn diagram.

\[ X = \{Ahmed, \ Sameh, \ Hanaa, \ Hanan, \ Mona, \ Mahmoud\} \]

\[ Y = \{Mona, \ Mahmoud, \ Rana, \ Hany, \ Hossam\} \]

The set of students who read Al-Gomhoria newspaper and do not read Al-Akhbar newspaper is \( X - Y \).

\[ X - Y = \{...., ......., ......., .......\} \]

\[ Y - X = \{......., ......., .......\} \] What do you observe?

Note that

\( X - Y \) is not equal to \( Y - X \)
Think

\[ U - X = \quad U - Y = \]

Note that

\[ X - X = \emptyset \quad \text{while} \quad X - \emptyset = X \]

Exercises

\[
\begin{array}{ll}
Y & X \\
\{2,3,4\} & \{1,3,5\} \\
X - Y = & Y - X = \\
Y - X = & Y - X = \\
\{1,2\} & \{3\} \\
X & Y \\
\{5\} & \{1\} \\
X - Y = & Y - X = \\
Y - X = & Y - X = \\
\{C, D\} & \{E\} \\
Y & X \\
\{C, D\} & \{E, F\} \\
X - Y = & X - Z = \\
Y - X = & Z - Y = \\
\end{array}
\]
1. Place the suitable symbol $\in$, $\in$, $\subset$ or $\subseteq$ in the blanks:
   - A. $8 \quad \{5, 7\}$
   - B. $(3) \quad \{1, 3, 2\}$
   - C. $2 \quad \{22, 44\}$
   - D. $(1, 2) \quad$ The set of prime numbers
   - E. $\emptyset \quad \{0\}$
   - F. $(X \cap Y) \quad X$

2. Complete each of the following sentences to have a true sentence:
   - A. If $X = \{2, 3\}$, $Y = \{3, 5\}$, then $X \cap Y = \quad$
   - B. If $\{1, X\} = \{2, Y\}$, then $X = \quad$, $Y = \quad$
   - C. If $X \subset Y$, then $X \cup Y = \quad$, $X \cap Y = \quad$
   - D. $\{1, 2, 4\} - \{2, 4, 6\} = \quad$
   - E. If $4 \in \{2, X, 7\}$, then $X = \quad$

3. Choose the true sentence from the parentheses:
   - A. $\{1, 7\} \quad \{0, 1, 2, 3, 4, \ldots\}$
     (\in \text{ or } \in \text{ or } \subset \text{ or } \subseteq)
   - B. $X - X = \quad$
     ($\emptyset$ or $\emptyset$ or $\emptyset$ or $\emptyset$ or $\emptyset$ or $\emptyset$)
   - C. If $\{2, 5, 7\} = \{5, A, 2\}$ then $A = \quad$ (2 or 5 or 7 or 0)
   - D. $(5) - \{1, 2, 5\} = \quad$
     ($\emptyset$ or $\emptyset$ or $\emptyset$ or $\emptyset$ or $\emptyset$ or $\emptyset$)
   - E. The number of subsets for the set $\{5\}$ is $\quad$ (0 or 1 or 2 or 3)

4. If $U = \{1, 2, 3, 4, 5, 6\}$, $X = \{2, 3, 5\}$ and $Y = \{3, 4, 5\}$. Represent the sets by Venn diagram, then write each of the following by the listing method.
   - $X \cup Y$, $X \cap Y$, $X - Y$ and $X'$

5. Describe the colored section in each of the following shapes:
6. Look at the opposite Venn diagram and find the following sets using the listing method:
   A. \(X \cup Y\)
   B. \(X \cap Y\)
   C. \(X - Y\)
   D. \(Y'\)
   E. \((X \cup Y)'\)

7. Write down all the subsets for the set \(X = \{a, b, c\}\).

8. Look at the opposite Venn diagrams, then find the following sets using the listing method:
   A. \(X \cap Z\)
   B. \(X - Y\)
   C. \(Y - Z\)
   D. \(X \cup Z\)
   E. \(Z - X\)
   F. \(X\)

9. If \(X = \{3, 4, 5\}\), \(Y = \{2, 3, 4\}\), place the suitable symbol \(\in\) or \(\notin\) or \(\subset\) or \(\subset\) in the blanks.
   A. \(2 \quad \in\)\(X\)
   B. \(\{3, 5\} \quad \in\)\(X \cap Y\)
   C. \(\{3, 2\} \quad \in\)\(X \cup Y\)
   D. \(5 \quad \in\)\(X - Y\)
   E. \(\emptyset \quad \in\)\(Y\)
   F. \(\{2, 3, 4\} \quad \in\)\(X\)

10. Find the value of \(x\) to make each of the following sentences true.
   A. \(3 \in \{5, 7, x + 1\}\)
   B. \(X \in \{2, 5\} \cap \{3, 5\}\)
   C. \(\{2, X\} \cap \{3, 7\} = \{3\}\)

11. Write down what each colored section represents in the following Venn diagrams.

12. Find all the subsets for the set \(X = \{a, b, c, d\}\) where each subset has 2 elements. Find the number of those sets.
1. Use the map of ARE, with the help of your teacher of geography then write down the following sets:

- \( X \) the set of Egyptian coastal governorates
- \( Y \) the set of the governorates in upper Egypt
- \( Z \) the set of the governorates in lower Egypt (Delta)

Find: \( X \cap Y \), \( Y \cup Z \) and \( X - Y \)

Is the set of the capitals of the world's countries a finite set? Explain why.

2. Form a team work with your classmates, then find:

- \( X \) The set of the students in your class who are older than 10 years.
- \( Y \) The set of the students in your class who are younger than 10 years.

Does \( X \cup Y \) represent the set of the students in your class?
1. Place the suitable symbol $\in$ or $\notin$ or $\subset$ or $\subseteq$ in the blanks to make each of the following sentences true:
   - A: $\{52\}$ $\subset$ $\{2, 5\}$.
   - B: $\{3\}$ $\subseteq$ $\{1, 3\}$.
   - C: 5 $\subseteq$ the set of the digits in the number 2513.
   - D: 4 $\notin$ $\{44\}$.

2. Look at the opposite Venn diagram, then find each of the following:
   - A: $X \cap Y$
   - B: $X \cup Y$
   - C: $X \setminus Y$
   - D: $Y^c \setminus X$
   - E: $Y^c$
   - F: $(X \cup Y)^c$

3. Choose the correct answer from the parentheses in each of the following sentences:
   - A: If $\{2, 3, 4\} = \{3, 4, x\}$ then $x =$ (2 or 3 or 4 or 5)
   - B: $\emptyset = \{0\}$
   - C: If $X \subset Y$ then $X \cap Y =$ (X or Y or $\emptyset$ or U)
   - D: $X \setminus X =$ (0 or (0) or $\emptyset$ or X)
   - E: If $a \in X$ then $a \subseteq X^c$ (c or $\notin$ or $\subseteq$ or $\in$ or $\subset$)

4. Write down what the colored section in each of the following Venn diagram represents:

5. IF $U = \{1, 2, 3, 4, 5, 6, 7\}$, $X = \{1, 2, 3, 4\}$ and $Y = \{1, 2, 5, 6\}$
   Write down each of the following sets using the listing method:
   - A: $X \cup Y$
   - B: $X \cap Y$
   - C: $X \setminus Y$
   - D: $X^c$
   - E: $Y^c$
   - F: $(X \cap Y)^c$
Unit 3

Geometry
The Circle

Hossam has become a new member in the scouts team. He has fixed a stake in the ground and tied a rope to the stake. Then, he fixed another stake at the other end of the rope. He completely pulled the rope, and turned a full turn around the fixed stake to draw a curved line on the ground.

Key Terms
- Circle
- The center of a circle
- The radius of a circle
- The diameter of a circle
- The chord of a circle

ACTIVITY
Take part with your physical education teacher at school and draw the circle on the football playground, then mark it using lime.

This closed curve is called a "circle".
The point in which the stake is fixed is called the center of the circle.

How to draw a circle

Use the compasses as illustrated in the following figure to draw a circle.
The red curved line represents the circle M.

The point M is called the center of the circle. The distance between the sharp point of the compasses and the pencil which draws the circle is called:

the length of the radius and it is denoted by the symbol (r)

**Example**

Draw a circle of a radius 3 cm.

**solution**

[Diagram of compasses and circle drawing process]

Adjust the compasses to the distance of 3 cm. Draw the circle using the compasses.

**Note that**

In the opposite figure: a circle of a radius (r)

**First:** The points A, B, X are located on the circle

i.e. \( a \in \text{Circle, then } MA = r \)

\( b \in \text{Circle, then } MB = r \)

Complete: \( x \in \text{Circle M, then } \)

**Second:** The point f is located inside the circle M.

So, Mf is shorter than the length of the radius.

i.e., \( Mf < r \)

Complete: d is located inside the circle M, then

**Third:** The two points c and e are located outside the circle so, Mc > r and similarly Me > r.
**Key Terms**

**The radius:**
The radius of a circle is a line segment whose endpoints are the center of the circle, and any point ∈ the circle.

*Ex.:* $MA$, $MB$, $MC$, $MD$

So, $MA = MB = MC = MD = r$

**The chord of a circle:**
The chord of a circle is a line segment that connects between any two points on the circle.

*Ex.:* Draw $AB$, $CD$, Draw each: $AC$, $AD$

Complete $AC$ is called ________, $AD$ is called ________.

**The diameter of a circle:** The diameter of a circle is a chord that crosses the center of the circle.

diameter $= 2 \times \text{Radius} = 2r$

The diameter is the longest chord in a circle.

---

**Practice**

1. Draw a circle of a radius 2cm where $M$ is the center of the circle.

   On the same paper on which you drew the circle, label the following points $A$, $B$, $C$ where $MA = 1.5cm$, $MB = 3cm$, $MC = 2cm$

   Complete by choosing (on, outside, or inside) the circle to make each sentence true:
   
   Point $A$ is located ________ the circle.
   
   Point $B$ is located ________ the circle.
   
   Point $C$ is located ________ the circle.
   
   Point $M$ is located ________ the circle.
1. In the opposite figure, there is a circle whose center is M. Complete:
   The radii of the circle are ______, ______, ______.
   The diameter of the circle is ______.
   The chords of the circle are ______, ______, ______.

2. In the opposite figure, there is a circle whose center is N. Complete:
   The radii of the circle are ______.
   The diameters of the circle are ______.
   The chords of the circle are ______.

3. In the opposite figure; M, N are two circles. Find the length of MN.

4. Draw a circle whose center is M and its diameter is 6cm, then draw a straight line that passes through the point M and intersects the circle at A, B. Draw another straight line that passes through the point M and intersects the circle at C, D.
   Complete:
   - AB is called ______ in the circle.
   - CD is called ______ in the circle.
   - MB is called ______ in the circle.
   - Put a suitable sign ( >, <, or = )
     AB ______ CD, MC ______ 3cm, BD ______ 6cm.
**3-2**

**Drawing a triangle given the lengths of its three sides**

You have learned to draw a triangle in the following two cases:

1. Given the lengths of two of its sides and the measure of the included angle.
2. Given the length of one of its sides and the measures of two angles.

Now, you will learn to draw a triangle given the lengths of its three sides using a ruler and a compasses.

**Example 1**

Draw the equilateral triangle ABC in which the length of every side is 4cm.

**Solution:**

1. Draw the line segment $\overline{AB}$ of length 4cm.
2. Adjust the compasses to a distance equal to 4cm, then place the sharp point at A and draw an arc.
3. Using the same distance, place the compasses at B, then draw another arc that intersects the first arc at C.
4. Draw $\overline{AC}$, $\overline{BC}$ So, you will have the equilateral triangle ABC.

**Practice**

Draw the equilateral triangle LMN whose perimeter is 9cm.
Example 2

Draw the isosceles triangle XYZ in which the length of the base = 4cm, and the length of each of its two other sides = 6cm.

Solution:
1. Draw the line segment $\overline{XY}$ where $XY = 4\text{cm}$.
2. Adjust your compasses to a distance equal to 6cm and with the tip of the compasses at X and draw an arc.
3. Place the sharp point to Y. Using the same distance to draw another arc that intersects with the first arc at Z.
4. Draw each of $\overline{XY}$, $\overline{YZ}$, so, you will have the isosceles triangle XYZ.

Practice

Draw the isosceles triangle in which $BC = 5\text{cm}$, $AB = AC = 4\text{cm}$.

Example 3

Draw the triangle ABC in which $AB = 4\text{cm}$, $BC = 5\text{cm}$, $AC = 6\text{cm}$

Solution:
1. Draw the line segment $\overline{AC}$ with length = 6cm.
2. Adjust your compasses to a distance equal to 4cm, then place the sharp point at A and draw an arc.
3. Adjust your compasses to a distance equal to 5cm, then place the sharp point at C and draw another arc that intersects the first arc at B.
4. Draw $\overline{AB}$, $\overline{BC}$ so, you will get the triangle ABC.
1. Draw the triangle ABC in which AB = 3cm, BC = 4cm, AC = 5cm. What do you observe?

2. Draw the triangle XYZ in which XY = YZ = 7cm, XZ = 4 cm.

3. Draw the triangle LMN in which LM = 8cm, MN = 5cm NL = 6cm.

4. Draw a circle of a radius 2.5cm and draw $\overline{AB}$ as its diameter, then complete drawing the equilateral triangle ABC, then choose the correct answer:
   - The point C is located ...... the circle (inside - outside - on)
   - $\overline{AC}$ is ....... (a chord - a radius - something else).

5. Draw the triangle ABC in which: AB = 4cm, BC = 6cm CA = 8cm. Then draw a circle whose center is B and its radius is equal to 4cm, then complete the following:
   - The point A is located ....... the circle.
   - The point C is located ....... the circle.
   - The .... is called the radius of the circle.

6. Draw the equilateral triangle ABC whose side is equal to 4cm, then draw a circle whose center is A and radius is equal to 4cm, then complete the following:
   - $\overline{AB}$ is called ....... in the circle.
   - $\overline{AC}$ is called ....... in the circle.
   - $\overline{BC}$ is called ....... in the circle.
Drawing line segments from the vertices of a triangle perpendicular to its opposite sides

**Introduction**

Drawing a line segment from a point, perpendicular to a straight line.

If \( \overrightarrow{AB} \) is a straight line, \( C \notin \overrightarrow{AB} \)

**Required:** drawing a line segment from point \( C \) perpendicular to \( \overrightarrow{AB} \)

**Materials**

The ruler - the right triangle

**Method**

1. Put the ruler on \( \overrightarrow{AB} \).
2. Put one of the right angle sides of the set square on the ruler as illustrated above in the figure.
3. Move the set square in the direction of the arrow. The set square will slide on the ruler till it reaches the point \( C \).
4. Draw \( \overrightarrow{CD} \) then \( \overrightarrow{CD} \perp \overrightarrow{AB} \).

**You will learn**

- To draw a line segment from a vertex of a triangle, perpendicular to the opposite side.
- To define the altitudes of a triangle.

**Key Terms**

- The altitudes of a triangle
First: The altitudes of the acute triangle:

In the opposite figure, ABC is an acute triangle. Follow the same previous steps to draw:

\[ AD \perp BC \quad \text{and} \quad BE \perp AC, \]
\[ CF \perp AB. \]

Note that

1. \( AD, \ BE, \ CF \) intersect at one point located inside the triangle ABC.
2. The line segments \( AD, \ BE, \ CF \) are called the altitudes of the triangle ABC.

Practice:

1. Draw the equilateral triangle ABC whose side is equal to 6cm. Then from its vertices, draw the segments \( AD, \ BE, \ CF \) perpendicular to the opposite sides: \( BC, \ CA, \ AB \) respectively. Then, measure the lengths of \( AD, \ BE, \ CF \). What do you observe?

2. Draw the triangle LMN in which \( LM = 4cm, \ MN = 5cm, \ NL = 6cm \). Then, draw a perpendicular from L to \( MN \) that intersects it at X. Also draw a perpendicular from M to \( LN \) that intersects it at Y, then measure the lengths of \( LX, \ MY \).
Second: The altitudes of the right triangle.

In the opposite figure, ABC is a right triangle in C.

Follow the same steps.

Draw a line segment from A perpendicular to \( \overrightarrow{BC} \), then the line segment will be \( \overline{AC} \).

Draw a line segment from B perpendicular to \( \overrightarrow{AC} \), then the line segment will be \( \overline{BC} \).

Draw a perpendicular line segment from C to \( \overrightarrow{AB} \), The perpendicular segment is \( \overline{CD} \).

Note that

1. \( \overline{AC} \), \( \overline{BC} \), \( \overline{CD} \) intersect at point C (the right vertex).

2. The altitudes of the triangle are \( \overline{AC} \), \( \overline{BC} \), \( \overline{CD} \).

Practice

1. Draw the isosceles triangle ABC whose right angle is B and in which \( AB = 5 \text{cm} \), then draw the line segment \( \overline{DB} \) from point B perpendicular to \( \overline{AC} \) and find the length of that line segment.

2. Draw a circle whose center is M and radius is equal to 4cm. Draw the diameter \( \overline{AB} \) and label the point C in the circle M, then draw the triangle ABC and the line segments from its vertices and perpendicular to the opposite sides of the triangle ABC, then label the point of intersection for these line segments.

3. Draw the triangle ABC in which \( AB = 6 \text{cm}, BC = 3 \text{cm}, m(\angle B) = 60^\circ \), then measure the altitudes of that triangle.
Third: The altitudes of the obtuse triangle:

In the opposite figure, ABC is a triangle whose angle C is obtuse. Follow the same previous steps:

Draw $\overrightarrow{AD} \perp \overrightarrow{BC}$.

and similarly $\overrightarrow{BE} \perp \overrightarrow{AC}$,

$\overrightarrow{CF} \perp \overrightarrow{AB}$

Note that

- The altitudes of the triangle are the segments: $\overrightarrow{AD}$, $\overrightarrow{BE}$, $\overrightarrow{CF}$.

- $\overrightarrow{AD}$, $\overrightarrow{BE}$, $\overrightarrow{CF}$ intersect at one point which is located outside the triangle ABC.

Practice

1. Draw the triangle ABC in which $AB = 5cm$, $BC = 6cm$, $m(\angle B) = 120^\circ$. Then, draw $\overrightarrow{AD}$ perpendicular to $\overrightarrow{BC}$, and measure the length of $\overrightarrow{AD}$. Draw also $\overrightarrow{BE}$ perpendicular to $\overrightarrow{AC}$ and measure the length of $\overrightarrow{BE}$.

Are $\overrightarrow{AD}$ and $\overrightarrow{BE}$ intersected at one point?

2. Draw the rectangle ABCD in which $AB = 3cm$, $BC = 5cm$, then label the point $X \in \overrightarrow{DA}$ where $AX = 2cm$. How many locations can be labeled for the point $X$ on the ray $\overrightarrow{DA}$. Draw the triangle XBC then draw $\overrightarrow{XY}$ perpendicular from X to $\overrightarrow{BC}$.

Can you know the length of $\overrightarrow{XY}$ without measuring it by a ruler?
1. Put (✓) for the true sentence and (✗) for the false one:
   A. The length of the diameter of a circle > the length of any chord which doesn't pass through its center. (✓)
   B. The right triangle has only one altitude. (✗)
   C. The line segments drawn from the vertices of the acute triangle perpendicular to the opposite sides intersect at one point inside the triangle. (✓)
   D. Only one diameter can be drawn from any point on the circle. (✗)
   E. The diameter of the circle divides it into two equal halves. (✓)

2. Draw a circle whose center is N and diameter is 6cm. Then draw the diameter \( \overline{AB} \) and the chord \( \overline{AC} \) in the circle. Draw \( \overline{BC} \). Use the protractor to find the measure \( \angle ACB \) and draw \( \overline{CD} \perp \overline{AB} \) that intersects it at D and the circle at E, then choose the correct answer:
   A. The triangle ABC is .......... (a right triangle - an acute triangle - an obtuse triangle)
   B. CE is ..... in the circle (chord - diameter - radius).
   C. The intersection point of the perpendicular line segments drawn from the vertices of the triangle ABC to the opposite sides is (C - D - E)

3. Draw a circle whose center is M and radius 4cm then draw two radii \( \overline{MX} \), \( \overline{MY} \) and the included angle between them measures 60° then draw \( \overline{XY} \) and find the length of \( \overline{XY} \).
4. Draw the triangle ABC in which AB = 7cm, BC = CA = 6cm. Then, draw the line segment from point C that is perpendicular to AB and find its length.

5. Draw the triangle XYZ in which XY = 3cm, YZ = 5cm, ZX = 7cm. Determine the type of the triangle according to the measures of its angles, then draw the perpendicular segment from X to YZ and measure its length.

6. In the opposite figure, find the perimeter of the square ABCD given the length of the circle's radius = 3cm.

7. In the opposite figure, M, N are two circles where their diameters are 4cm, 6cm. Find the length of MN.

8. In the opposite figure, there are two circles with the same center M. If their radii were 2cm, 5cm. Complete:
   A. The length of CD = ___ cm
   B. The length of AB = ___ cm

   Draw the ray DC from D which intersects the small circle at E and intersects the large circle at F, then find the length of DF.

9. Draw the triangle ABC in which AB = 6cm, BC = 8cm and AC = 10cm. Draw the circle M in which AC is the diameter and find the length of MB.
Activity

Play with the compasses

1. Draw the following figure, and innovate other decorative figures.

![Diagram](image)

2. Notice the pattern by placing points on the circle. Draw the line segments that connect every two points, then you will be able to determine the number of zones which are included in the surface of a circle.

- ![Diagram](image)

How many zones are there on the circle in case of having five points?
1. Complete the following to have true sentences:
   A. The chord of a circle is a line segment that connects ...........
   B. The longest chord in a circle is called ...........
   C. The midpoint of any diameter in a circle is ........... of the circle.
   D. ........... is used in drawing the circle.

2. Choose the correct answer from the parentheses:
   A. If M is a circle whose diameter is 8cm where MA = 7cm then the point A is located (inside - outside - on) the circle.
   B. If A, B belong to the circle M where M ∈ AB then AB is called a (chord - diameter - radius) in the circle.
   C. The number of altitudes in any triangle = (1 - 2 - 3).
   D. If AB, AC are two chords in a circle, then BC is a (chord Center radius) in the same circle.
   E. In the opposite figure, if the length of each radius in the three circles is 3cm, then the perimeter of the triangle MLN = (6 - 9 - 18) cm

3. A. Draw a circle whose centre is M and radius is 2.5cm. Then draw its diameter AB and draw its chord AC of length 3cm. Draw BC then find its length.
   B. Draw the isosceles triangle ABC in which BC = 4cm, and AB = AC = 6cm. Then, draw perpendicular segments from their vertices to their three sides.
Experimental Probability

Let’s play

When you toss one coin there are two possible ways the coin can land either head \(H\) or tail \(T\): 

The class is divided into groups. Each group tosses a coin 10 times, 20 times, 50 times and 100 times then observe the results and record them in the following table:

<table>
<thead>
<tr>
<th>number of tossing a coin</th>
<th>number of occurrence of heads</th>
<th>number of occurrence of tails</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 times</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 times</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What do you notice?

Notice:

Increasing the number of tossing a coin tells the fact that the number of occurrence of heads is nearly equal to the number of occurrence of tails.

For instance, tossing a coin 1000 times

the numbers of occurrence of heads may be 506 times while the number of occurrence of tails may be \(1000 - 506 = 494\) times.

It is said: the probability of occurrence of heads in 1000 times \(= \frac{506}{1000} = 0.506\) while the probability of occurrence of tails in 1000 times \(= \frac{494}{1000} = 0.494\)
Think
Is it possible to predict the number of occurrence of heads when tossing a coin 10000 times? Explain.

Example
The opposite table shows the result of a survey of asking 40 students about their favorite breakfast.

What is the probability of choosing foul and tamaya?
What is the probability of choosing pies?
What is the probability of choosing cheese and dessert?

If the number of student is 400 students. How can you predict about the number of students choosing foul and tamaya?

Solution

<table>
<thead>
<tr>
<th>Breakfast</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Foul and tamaya</td>
<td>20</td>
</tr>
<tr>
<td>Pie</td>
<td>4</td>
</tr>
<tr>
<td>Cheese and dessert</td>
<td>16</td>
</tr>
</tbody>
</table>

Probability of choosing foul and tamaya = \( \frac{20}{40} = \frac{1}{2} \)
Probability of choosing pie = \( \frac{4}{40} = \frac{1}{10} \)
Probability of choosing cheese and dessert = \( \frac{16}{40} = \frac{2}{5} \)

Thus, the prediction about the number of students choosing foul and tamaya = \( 400 \times \frac{1}{2} = 200 \) students.

Think
If the number of students in the survey applied was 800 students. How can you predict:

A. The number of students choosing “Pie”?
B. The number of students choosing “Cheese and Dessert”?

Exercises

1. Electric lamps manufacturing company keeps track of 1000 lamps of its production to know the maximum working hours before tearing down. The following table lists these data:

<table>
<thead>
<tr>
<th>Maximum working hours</th>
<th>less than 150 h</th>
<th>150 – 400 h</th>
<th>400 – 1000 h</th>
<th>more than 1000 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lamps</td>
<td>80</td>
<td>250</td>
<td>350</td>
<td>320</td>
</tr>
</tbody>
</table>

If you bought a lamp at this company, what is the probability to tear down?

A. Before 150 working hours
B. After 400 working hours.
2. Rolling a number cube numbered from (1 to 6) 250 times. How many times are predicted to get an even number?

3. A survey was applied to ask 10 students about the foreign language they prefer to study. 5 students prefer English, 3 students prefer French and 2 students prefer German. If the total number of students in the school is 600 students. How many students are predicted to prefer studying German?

4. Eman, Aml and Maha clean their school in turns. They roll a number cube with two faces numbered 1, two faces numbered 2 and two faces numbered 3. Eman does the cleaning if the faces numbered 1 appear. Aml does the cleaning if the faces numbered 2 appear. Maha does the cleaning if the faces numbered 3 appear. How often do you predict each one does the cleaning within a 30-day month?
Theoretical Probability

Think and Discuss

Discuss with your teacher the following experiments, their outcomes, and the sample space of each:

**Experiment 1:**
Tossing a regular coin and observing the outcomes.

**Outcomes:** There are 2 possible ways the coin can land: heads (H) or tails (T).

**Sample space:** \( S = \{H, T\} \)

**Experiment 2:**
Rolling a regular number cube numbered from 1 to 6.

**Outcomes:** All possible outcomes are 1, 2, 3, 4, 5, or 6.

**Sample space:** \( S = \{1, 2, 3, 4, 5, 6\} \)

**Experiment 3:**
Having a baby and determining the gender of the newborn baby.

**Outcomes:** a boy (B) or a girl (G).

**Sample Space:** \( S = \{B, G\} \)

**Experiment 4:**
Playing a football game and determining the result of a team. Outcomes: All possible outcomes are win, or ... or ...

**Sample Space:** \( S \{ \ldots, \ldots, \ldots \} \)

You will learn:

To find an event.

Key terms:
- Theoretical probability
- Outcomes of an experiment
- Sample space
4-2

**Experiment 5:**

To spin a spinner divided into 6 sections
Outcomes: all possible outcomes are 1, 2, 3, 4, 5, 6.
Sample space: \( S = \{ \ldots, 1, 2, 3, 4, 5, 6, \ldots \} \)
To spin an odd number is a subset of the sample space. This individual outcome is called an event and the subset = \( \{1, 3, 5\} \)

An event is a subset of the sample space

In experiment 5:
The probability of spinning an odd number = \( \frac{\text{number of outcomes of an event}}{\text{Number of all possible outcomes}} \) = \( \frac{3}{6} = \frac{1}{2} \)

**Examples**

1. A bag contains 5 white marbles, 7 black marbles and 3 red marbles. All marbles are equally likely in size. Randomly a marble is selected.

   Calculate the probability of selecting:
   - A black marble
   - A yellow marble
   - A white or red marble

   **Solution**

   \[ P(\text{black}) = \frac{\text{Number of black marbles}}{\text{Number of all possible outcomes}} = \frac{7}{15} \]
   \[ P(\text{yellow}) = \frac{0}{15} = 0 \text{ (impossible outcome)} \]
   \[ P(\text{white or red}) = \frac{5}{15} + \frac{3}{15} = \frac{8}{15} \]
2. A box contains 20 cards numbered from 1 to 20. Randomly a card has been selected. Calculate the probability of selecting:
   - A prime number
   - A number divisible by 7

**Solution**

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Number of Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>The event of selecting a prime number = {2, 3, 5, 7, 11, 13, 17, 19}</td>
<td>8</td>
</tr>
<tr>
<td>The event of selecting a number divisible by 7 = {7, 14}</td>
<td>2</td>
</tr>
</tbody>
</table>

- P (prime number) = \( \frac{8}{20} = \frac{2}{5} \)
- P (divisible by 7) = \( \frac{2}{20} = \frac{1}{10} \)

**Practice**

1. In the opposite figure: the spinner is divided into 6 colored sections. What is the probability that the spinner stops at:
   - A. Red.
   - B. Black.
   - C. Green.

2. Circle the true answer:
   - A. Tossing a regular coin, the probability of landing head = ...
     \( \left( \frac{1}{3}, \frac{1}{2}, \frac{3}{4}, 1 \right) \)
   - B. Rolling a regular number cube, The probability of getting a number divisible by 3 is .......
     \( \left( \frac{1}{3}, \frac{1}{2}, \frac{3}{4}, 1 \right) \)
   - C. A classroom holds 40 students, 25 are boys and the rest are girls. A student has been randomly selected, the probability of getting a girl is
     \( \left( \frac{3}{8}, \frac{5}{8}, \frac{3}{5}, 1 \right) \)
1. Complete:
   A. A box contains 24 lamps, 3 lamps are defective. A lamp has been randomly selected, the probability of getting a functional lamp = ....
   B. The probability of failing a student is \(\frac{2}{15}\). The probability of success = ....
   C. A card has been drawn out of 5 cards containing the numbers:
      
      \[
      \begin{array}{cccc}
      32 & 25 & 14 & 63 \\
      27 &  &  & 
      \end{array}
      \]
      
      The probability of selecting a number that the sum of its two digits is 9 = ....
   D. Rolling a regular number cube. The probability of getting an even number = ....
      The probability of getting an odd number = ....
      The probability of getting a prime number = ....
      The probability of getting a number greater than 6 = ....

2. The following table lists the results of a survey applied on 100 spectators of T.V.

<table>
<thead>
<tr>
<th>Program</th>
<th>arabic films</th>
<th>foreign films</th>
<th>series</th>
<th>news</th>
<th>football matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of spectators</td>
<td>19</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>36</td>
</tr>
</tbody>
</table>

A spectator has been randomly selected. Find the probability of selecting a spectator prefers

A. football matches.  B. foreign films  C. series  D. news

3. A card has been randomly drawn out of 10 cards numbered from 1 to 10. Find the probability of getting:
   A. An odd number
   B. A prime number.
   C. An even number greater than 6

4. A spinner is divided into 6 equal sections.
   A. What is the probability of spinning on any section?
   B. Spinning the spinner 60 times. How many times are predicted to get the letter (A) as an outcome?
A survey has been applied to ask 50 students about their favorite games:

A. What is the probability that football is the favorite game?
B. If the number of your school students is 500 students, then predict the number of students preferring football games.
C. What is the probability that basketball is the favorite game?
D. In your opinion, how many students out of 500 students would prefer a basketball game?

<table>
<thead>
<tr>
<th>Students favorite Games</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football</td>
<td>25</td>
</tr>
<tr>
<td>Basketball</td>
<td>7</td>
</tr>
<tr>
<td>Table tennis</td>
<td>8</td>
</tr>
<tr>
<td>Swimming</td>
<td>10</td>
</tr>
</tbody>
</table>
1. The following table lists the number of 120 volunteers in 3 groups to make uniforms for the cleaners.

<table>
<thead>
<tr>
<th>Group</th>
<th>Design</th>
<th>Printing</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of volunteers</td>
<td>30</td>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>

A volunteer has been randomly selected. What is the probability to be one of the printing group?

2. A regular number cube. What is the probability of getting an even number and not divisible by 3?
   - A
   - B

   A card has been randomly selected out of cards numbered from 1 to 25. What is the probability of getting a prime number?

3. Tourists successively visit Egypt. A tourist company has organized a trip for 100 tourists to visit Egypt, 40 from Arab countries, 30 from Europe, 10 from America and 20 from Asia. The number of tourists who visited Egypt in this month was 15000 tourists. What is the predicted number of tourists from Europe who visited Egypt in this month?

4. A spinner is divided into 4 equal sections.
   - A
   - B

   What is the probability of spinning the letter B?
   - A
   - B

   Spin the spinner 400 times. What is the predicted number of getting letter A?
Model tests
First: Choose the correct answer:

1. The triangle whose measures of their angles $50^\circ, 90^\circ, 40^\circ$ is ............
   (an acute angled triangle, an obtuse angled triangle, a right angled triangle, otherwise)

2. $4 \frac{1}{8} \times 2 \frac{2}{3} = ............$
   (1, 10, 11, 111)

3. If $\{7,10\} \subset \{10,x+4\}$, the $x = ............$
   (3, 4, 5, 6)

4. $3.75 \times 1000 = ............$
   (0.375, 0.0375, 3750, 37.5)

5. $\frac{1}{2} \quad \frac{1}{3}$
   $(<, >, =, \geq)$

6. The Shaded part is ............
   (x \cap y, x \cup y, y \subset x, x \subset y)

7. $55.241 \times 100 \quad \square \quad 552.41 \times 10$
   $(<, >, =, \geq)$

8. $\frac{2}{3} \times ............ = 1$
   (1, 2, 3, 3/2)

9. 43 day $\simeq$ ............ to nearest week
   (4, 6, 5, 7)

10. Any chord passing through the centre of a circle is called ............
    (a diameter, a radius, a side, an otherwise)
11. \( \{ 52 \} \) \( \{ 5, 2 \} \) \( \in, \notin, \subset, \supset \)

12. \( 12.3 \times \) \( = 1230 \) \( \in, \notin, \subset, \supset \)

13. \( Y = \{ 2, 4, 6 \} \cap \{ 1, 2, 3 \} \), then \( 6 \) \( \in, \notin, \subset, \supset \)

14. \( \frac{5}{8} \) \( = 0.5734 \) \( <, >, =, \geq \)

15. Second: Complete:
   In the opposite figure:
   a) \( MA = \) \( \) \( \) 
   B) The longest chord in the circle is \( \) \( \)

16. \( \frac{4}{12} \div \frac{6}{12} \) \( = \) \( \)

17. The probability of the sure event = \( \)

18. If \( \frac{x}{8} = \frac{15}{24} \), then \( x = \) \( \)

19. 2.4 decimeter = \( \) \( \) cm.

20. In the opposite figure:
    if \( ME = 3 \) cm, then the perimeter of the square = \( \) \( \) cm

Mathematics - Fifth Primary
21 \[ 65.384 \div \ldots \ldots \ldots = 65 \]

22 \[ \frac{3}{25} \div \ldots \ldots \ldots = \frac{25}{3} \]

23 Draw the triangle ABC where:
   AB = 4cm, BC = 6cm, CA = 8cm then draw a circle its centre B and its radius 4cm.
24. From the table, find the probability that a pupil play basketball.

<table>
<thead>
<tr>
<th>Game</th>
<th>football</th>
<th>basketball</th>
<th>handball</th>
</tr>
</thead>
<tbody>
<tr>
<td>number of pupils</td>
<td>50</td>
<td>40</td>
<td>10</td>
</tr>
</tbody>
</table>

25. Arrange in descending order:

\[
5 \frac{1}{2}, \ 6 \frac{1}{4}, \ 5 \frac{3}{4}, \ 5 \frac{2}{5}
\]

26. Find the width of a rectangle whose area is 10.25 metre square, its length is 4.1 metre, then find its perimeter.
First: Choose the correct answer:

1. 3.36 km = ................. m  (3.36, 33.6, 336, 3360)

2. 9 \(\frac{3}{25}\) \(\approx\) ................. to the nearest tenth  (0.9, 9.2, 9.1, 9)

3. \(\frac{5}{6}\) \(\div\) 1 \(\frac{1}{6}\) = .................  (\(\frac{5}{7}\), \(\frac{2}{6}\), \(\frac{3}{7}\), \(\frac{7}{6}\))

4. 0.312 \(\times\) 100 ................. 312 \(\div\) 10  (\(>\), \(<\), \(=\), \(\leq\))

5. The smallest number from the following is........... (0.111, 0.12, 0.123, 1.023)

6. 10 \(\times\) 4.72 \(\square\) 100 \(\times\) 0.472  (\(<\), \(>\), \(=\), \(\geq\))

7. \(\frac{3}{5}\) \(\times\) 1.6 \(>\) 1.6 \(\times\) .................  (0.6, 1.6, \(\frac{5}{3}\), 0.3)

8. The shaded part represents .............  (\(\mathcal{X}\)ny, \(\mathcal{X}\)uy, \(\mathcal{X}-\mathcal{Y}\), \(\mathcal{Y}-\mathcal{X}\))

9. If \(Y = (2, 3, 5) \cap (1, 3, 5)\), then (1, 2) ... \(Y\)  (\(\subset\), \(\subset\), \(\notin\), \(\in\))

10. In the opposite figure:

    MN = ................. cm  (2, 3, 6, 5)
11. The length of the diameter of any circle _______ the length of any chord in it does not passing through the centre

( >, <, =, ≥)

12. \{0\} ........ \{1, 2, 5, 8\}

(⊂, ∉, ∈, ∉)

13. The number 736.592 = 736.59 to the nearest ............
(tenth hundredth, thousandth)

14. If \( \frac{2}{3} = \frac{16}{c} \), then the value of \( c \) = ............ (2, 3, 12, 24)

Second: Complete

15. If the probability of a pupil succeed in an exam is \( \frac{8}{10} \), then the probability his fail = ............

16. If \( x \subset y \), then \( x \cap y = \) ............
17. In the opposite figure, the corresponding height the base $BC$ is ....................

18. The shaded part represents ............

19. A circle its radius = $1\text{cm}$, then its diameter = ....... $\text{cm}$

20. $4.6798 \approx .............$ (to nearest thousandth)

21. $\frac{21}{4} \times .............. = 1$

22. $3978 \div ...... = 3.978$

23. If $U = \{ x: x$ is an odd number $< 15 \}$, $X = \{1, 3\}$, $Y = \{1, 5, 9, 13\}$.
   Draw a Venn diagram that represents the sets $U$, $X$, $Y$ then find $X \cap Y$
24. Draw a Circle of radius 2.5 cm. then draw the dimetre $\overline{AB}$ and the chord $\overline{AC}$ of length 3 cm. join $\overline{BC}$ measure its length.

25. A box contains identical balls where 5 balls are white, 9 red and 6 black.

If one ball is choosen randomly, what is the probability that the choosen ball is white.

26. A rectangle its length is 4.1 cm and its is width 3.5 cm, calculate its area.
First: choose the correct answer:

1. \( \frac{1}{3} \times \frac{3}{4} = \ldots \) \( \left( \frac{1}{3}, \frac{1}{2}, \frac{1}{4} \right) \)

2. If \( 3 \in \{ x, 5 \} \), then \( x = \ldots \) \( (5, 3, 8) \)

3. \( 312 \div 10 = \ldots \) \( (3.12, 0.312, 31.2) \)

4. The shaded part is \( (x \cup y, x \cap y, x - y) \)

5. \( \overline{AB} \) is called a \ldots \( \text{(diameter, radius, side)} \)

6. \( 14.4 \times 10 \square 144 \) \( (>, <, =) \)

7. In any triangle there are \ldots \( \text{heights} \) \( (1, 2, 3) \)

8. \( \{5\} \ldots \{5, 8\} \) \( \subseteq, \notin, \subset \)

9. When tossing a coin once the probability of appearing a tail = \ldots \( \left(1, \frac{1}{2}, \frac{1}{4}\right) \)

10. \( \frac{1}{2} = \ldots \) \( (5, 0.5, 0.05) \)
Second: Use the following answers to complete the questions below:

\( \left( \frac{1}{6}, 12.1, 2, 4.9, (1,5) \right) \)

1. \(4.85 \approx \ldots\) to nearest tenth

2. When tossing a die once, the probability of appearing the number \(3\) = \ldots\.

3. \(48.4 \div 4 = \ldots\)

4. A circle of diameter = 4cm, then its radius = \ldots\. cm

5. If \(X = \{1, 2, 5, 7\}, y = \{1, 5, 3\}\) the \(X \cap Y = \ldots\)
Third: Match

A

1. \( x \) \( y \)
   the shaded part is

2. \( \frac{1}{2} \) \( \square \) \( \frac{1}{3} \)

3. \( \frac{25}{100} \approx \) to nearest tenth

4. the probability that
   Samir win a match is \( \frac{1}{2} \), then the probability
   of loss = ..................

5. \( \overline{AD} \) is called ..................

B

\( > \)

\( \frac{1}{2} \)

\( xny \)

\( \text{altitude} \)

\( 4.3 \)
المواصفات الفنية

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رقم الإعداد
13287

شركة أخبار اليوم للاستثمار