LESSON 1.1

1 Write the next two terms in each sequence. Fully describe the term-to-term rule you have used.
   a 3, 7, 11, ...
   b 5, 10, 20, ...
   c 30, 25, 20, ...
   d 2, 4, 8, ...
   e 1, 8, 15, ...
   f 7, 9, 11, ...
   g 5, 14, 23, ...
   h 7, 13, 19, ...
   i 13, 26, 39, ...

2 Find at least one sequence between each pair of numbers. Fully describe the term-to-term rule you have used.
   a 1, ...
   b 1, ...
   c 5, ...
   d 4, ...
   e 10, ...
   f 16, ...

LESSON 1.2

In each of the following sequences, find the missing terms and the 50th term.

<table>
<thead>
<tr>
<th>Term</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
<th>8th</th>
<th>10th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequence A</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>...</td>
</tr>
<tr>
<td>Sequence B</td>
<td>...</td>
<td>8</td>
<td>...</td>
<td>18</td>
<td>...</td>
<td>28</td>
<td>...</td>
<td>39</td>
<td>...</td>
</tr>
<tr>
<td>Sequence C</td>
<td>...</td>
<td>...</td>
<td>18</td>
<td>26</td>
<td>...</td>
<td>42</td>
<td>50</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Sequence D</td>
<td>...</td>
<td>...</td>
<td>25</td>
<td>...</td>
<td>47</td>
<td>...</td>
<td>80</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Sequence E</td>
<td>...</td>
<td>11</td>
<td>...</td>
<td>23</td>
<td>...</td>
<td>41</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

LESSON 1.3

Find the generalisation (nth term) for the number of matchsticks in the following patterns. Use this generalisation to help find the 50th term in each pattern.

1

2

3 a Find the generalisation and the 50th term for the number of matchsticks in this pattern.

b Find the generalisation and the 50th term for the number of squares in this pattern.
LESSON 1.4

1. Draw diagrams to illustrate the following functions.
   - a) multiply by 4 → add 5
   - b) add 5 → multiply by 4
   - c) add 1 → multiply by 3
   - d) multiply by 3 → add 1

2. What do the functions and your diagrams show you about the order in which you combine functions?

3. Write down the inverse function of each of these:
   - a) multiply by 5
   - b) add 6
   - c) divide by 2
   - d) subtract 7

LESSON 1.5

Draw a mapping diagram to illustrate each of these functions.
   - a) $x \rightarrow 2x + 5$
   - b) $x \rightarrow 4x - 1$
   - c) $x \rightarrow 3x + 2$
   - d) $x \rightarrow 5x - 2$

LESSON 1.6

Investigate the function $10x + y \rightarrow 10y + x - 1$.

For example:
   - $36 \rightarrow 63 - 1 = 62 \rightarrow 26 - 1 = 25 \rightarrow 52 - 1 \ldots$
LESSON 2.1

1 Without using a calculator, write down the answer to each of these.
   a 0.57 × 100        b 3.2 ÷ 1000        c 0.19 × 10        d 0.013 ÷ 10
   e 0.02 × 100        f 2.37 × 1000       g 0.237 ÷ 10       h 0.09 × 10

2 Fill in the missing operation in each case.
   a → b → c → d →
   a 0.077 → → → 77   b 345 → → → 3.45
   c 0.623 → → → 623   d 400 → → → 0.4

3 Find the missing number in each case.
   a 0.6 × 10 = □       b 0.06 × □ = 600   c 0.6 ÷ 10 = □
   d 6 ÷ □ = 0.06       e 0.6 × 100 = □     f 0.6 × □ = 600
   g 0.06 ÷ 10 = □      h 0.6 ÷ □ = 0.06    i □ ÷ 100 = 0.06

LESSON 2.2

1 Using a table with place-value headings, fill in the following numbers. Then use your table to write the numbers in order from smallest to largest.
   0.65, 0.7, 0.56, 0.602, 0.622, 0.6, 0.08

2 Write each of the following sets of numbers in order from the smallest to the largest.
   a 2.05, 1.9, 2.1, 2.23, 1.999       b 0.056, 0.05, 0.062, 0.502, 0.06

3 Write each of the following lengths in order: 2 cm, 0.05 m, 342 cm, 1.23 m, 0.97 m.

4 Write the following amounts of money in order: 20p, £1.32, £0.76, £0.16, 54p.

5 Put the correct sign, > or <, between each pair of numbers.
   a 0.045 □ 0.04       b 1.32 □ 1.4       c 8p □ £0.12

LESSON 2.3

1 Work out:
   a −4 + 5 − 7       b +7 − 2 − 8       c −2 − −3 + −5

2 Find each missing number.
   a +6 − □ = −2       b □ − −3 = −6       c +8 + □ = 2       d □ + □ = 0

3 Work out each of these.
   a +8 × −5          b −3 × −3          c +6 × +7          d −7 × +2          e −3 × −10 × +2

4 Work out each of these.
   a +25 ÷ −5         b −18 ÷ −3         c +28 ÷ +7         d −9 ÷ +2         e −3 × −10 ÷ +5
LESSON 2.4

1 Explain why each of these calculations must be wrong.
   a 63 × 36 = 2286    b 63 × 36 = 3268    c 714 – 68 = 654

2 Estimate the answers to each of these.
   a 21.6 × 38.4    b 184 ÷ 28    c \( \frac{52.3 + 39.6}{18.6 - 5.4} \)    d \( \frac{49.3 + 51.7}{26.5} \)

3 Estimate the answer to each of these.
   a 21 × 0.69    b 89 × 0.71    c 5.9 × 0.59

LESSON 2.5

1 Using the column method, work out each of the following. Show all your working clearly.
   a 43.2 + 16.7    b 6.79 + 5.4    c 302.3 + 7.92 + 0.9

2 Using the column method, work out each of the following. Show all your working clearly.
   a 43.2 – 16.7    b 6.79 – 5.4    c 302.3 – 7.92 – 0.9

3 Using the column method, work out each of the following. Show all your working clearly.
   a 8.3 × 6    b 7.34 × 7    c 8.9 × 5

LESSON 2.6

To make a number chain start with a two-digit number.
   When the number is even, divide it by 2.
   When the number is odd, subtract 1 and double it.

For example, starting with 7 the chain is
   7, 12, 6, 3, 4, 2, 1, 0, 0, ...

So, stop the chain when it gets to 1.

Start with other numbers below 20. What is the longest chain you can get?
Lesson 3.1

1. Estimate the area of each of the following shapes. Each square represents one square centimetre.

   a. 
   
   b. 

2. Find i the perimeter and ii the area of each of these compound shapes.

   a. 
   
   b. 
   
   c. 

Lesson 3.2

1. Calculate the area of each of the following triangles.

   a. 
   
   b. 
   
   c. 

2. Calculate the area of each of the following parallelograms.

   a. 
   
   b. 
   
   c. 

3. Calculate the area of each of the following trapezia.

   a. 
   
   b. 
   
   c. 

**LESSON 3.3**

1. Draw an accurate net for this open box.

   ![Net for open box](image)

2. The nets below are for three solids. Write down the name for each one?

   a. ![Net 1](image)
   b. ![Net 2](image)
   c. ![Net 3](image)

3. a. Draw accurately on an isometric grid the L-shape below.

   ![L-shape](image)

   b. How many faces, vertices and edges does the L-shape have?

**LESSON 3.4**

1. Find the surface area of a cuboid with \( l = 20 \text{ cm}, w = 8 \text{ cm}, h = 3 \text{ cm} \).

2. Find the volume of a cuboid with \( l = 8 \text{ m}, w = 6 \text{ m} \) and \( h = 3 \text{ m} \).

3. A cube has a surface area of 294 cm\(^2\).
   a. Find the length of an edge of the cube.
   b. Find the volume of the cube.

4. The squares on the outside of a cube with edge length 5 cm are painted dark grey, light grey and white, as shown on the diagram on the right.

   a. How many squares are coloured dark grey?
   b. How many squares are coloured light grey?
   c. How many squares are coloured white?
CHAPTER 4

Number 2

LESSON 4.1

1 Find the missing number in each of these equivalent fractions.
   \[
   \begin{align*}
   a \quad \frac{5}{6} &= \frac{\square}{36} & b \quad \frac{7}{8} &= \frac{\square}{40} & c \quad \frac{2}{9} &= \frac{\square}{36} & d \quad \frac{7}{3} &= \frac{\square}{12}
   \end{align*}
   \]

2 Cancel each of these fractions to their lowest terms.
   \[
   \begin{align*}
   a \quad \frac{3}{12} & b \quad \frac{5}{35} & c \quad \frac{12}{28} & d \quad \frac{15}{45} & e \quad \frac{18}{24} & f \quad \frac{5}{30} & g \quad \frac{24}{54} & h \quad \frac{35}{15}
   \end{align*}
   \]

LESSON 4.2

1 Convert each of the following decimals to a fraction.
   \[
   \begin{align*}
   a \quad 0.3 & b \quad 0.12 & c \quad 0.38 & d \quad 0.75 & e \quad 1.85
   \end{align*}
   \]

2 Convert each of the following fractions to a decimal.
   \[
   \begin{align*}
   a \quad \frac{4}{1} & b \quad \frac{7}{7} & c \quad \frac{11}{1} & d \quad \frac{11}{11} & e \quad \frac{11}{11}
   \end{align*}
   \]

LESSON 4.3

1 Work out each of these. Convert to mixed numbers or cancel down to lowest terms if necessary.
   \[
   \begin{align*}
   a \quad \frac{1}{3} + \frac{1}{3} & b \quad \frac{1}{4} + 1 \frac{1}{4} & c \quad \frac{1}{2} + \frac{1}{2} & d \quad 1 \frac{1}{2} - \frac{1}{2} & e \quad 2 \frac{1}{2} - 1 \frac{1}{2} & f \quad \frac{5}{4} - \frac{3}{4} & g \quad 2 \times \frac{1}{2}
   \end{align*}
   \]
   \[
   \begin{align*}
   h \quad 3 \times \frac{7}{4} & i \quad \frac{1}{4} + \frac{1}{4} - \frac{1}{4} & j \quad \frac{1}{4} \div 4 & k \quad \frac{1}{2} + \frac{1}{2} & l \quad \frac{1}{4} - \frac{1}{4} & m \quad \frac{1}{2} \times \frac{1}{2} & n \quad \frac{1}{2} + \frac{1}{2}
   \end{align*}
   \]
   \[
   o \quad \frac{1}{4} - \frac{1}{2}
   \]

2 Work out each of these.
   \[
   \begin{align*}
   a \quad \frac{1}{3} \text{ of } 21 \text{ cm} & b \quad \frac{1}{2} \text{ of } £120 & c \quad \frac{3}{4} \text{ of } 28 \text{ kg}
   \end{align*}
   \]

LESSON 4.4

1 Work out the equivalent percentage and fraction to each of the following decimals.
   \[
   \begin{align*}
   a \quad 0.5 & b \quad 0.6 & c \quad 0.95 & d \quad 0.84 & e \quad 0.38
   \end{align*}
   \]

2 Work out the equivalent decimal and fraction to each of the following percentages.
   \[
   \begin{align*}
   a \quad 45\% & b \quad 90\% & c \quad 32\% & d \quad 19\% & e \quad 6\%
   \end{align*}
   \]

3 Work out the equivalent percentage and decimal to each of the following fractions.
   \[
   \begin{align*}
   a \quad \frac{5}{1} & b \quad \frac{7}{7} & c \quad \frac{11}{11} & d \quad \frac{11}{11} & e \quad \frac{11}{11}
   \end{align*}
   \]

4 Work out the final amount when:
   \[
   \begin{align*}
   a \quad £65 \text{ is increased by } 15\% & b \quad £84 \text{ is decreased by } 15\% & c \quad £140 \text{ is increased by } 35\% & d \quad £80 \text{ is decreased by } 20\%
   \end{align*}
   \]
LESSON 4.5

1 What number is halfway between each of these pairs?  
   a $\frac{1}{2}$ and $\frac{3}{4}$  
   b $\frac{1}{2}$ and 1$\frac{1}{2}$

2 Which of these is the greater?  
   a $\frac{1}{4}$ of 35 or $\frac{1}{4}$ of 20  
   b $\frac{1}{4}$ of 108 or $\frac{1}{4}$ of 70

3 Which of these shops is giving the better value?  
   Derek’s Fashions: Armani suits reduced by $\frac{1}{2}$ from £650  
   Mary’s Modes: Armani suits reduced by $\frac{1}{4}$ from £680

CHAPTER 5

Handling Data 1

LESSON 5.1

1 Find the mode, median and range of each of the following sets of data.  
   a 11, 12, 13, 12, 14, 11, 12  
   b 66, 72, 78, 75, 78, 68, 63  
   c 1, 0, 1, 0, 1, 0, 1, 0, 1, 1  
   d 21, 24, 26, 29, 34, 32, 27, 25, 24, 19

2 David is taking part in a fishing competition. At the end of the competition, the weight of each fish in his keep net is as follows: 300 g, 450 g, 620 g, 300 g, 550 g, 300 g, 410 g.  
   a Find the modal weight of the fish.  
   b Find the median weight of the fish.  
   c Find the range for the weight of the fish.

3 Given below are the age, height and weight of each of seven girls in a netball team.  

<table>
<thead>
<tr>
<th></th>
<th>Anna</th>
<th>Claire</th>
<th>Chloe</th>
<th>Beth</th>
<th>Lauren</th>
<th>Martha</th>
<th>Sarah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>14</td>
<td>16</td>
<td>13</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>160</td>
<td>164</td>
<td>161</td>
<td>157</td>
<td>153</td>
<td>167</td>
<td>168</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>40</td>
<td>41</td>
<td>36</td>
<td>31</td>
<td>34</td>
<td>41</td>
<td>39</td>
</tr>
</tbody>
</table>

   a Find the median age of the team. Which girl has the median age?  
   b Find the median height of the team. Which girl has the median height?  
   c Find the median weight of the team. Which girl has the median weight?  
   d Who would you choose as the average player in the team? Give a reason for your answer.
LESSON 5.2

1 Find the mean of each set of data, giving your answer to one decimal place.
   a 12, 14, 11, 10, 12, 15
   b 89, 92, 78, 102, 88, 76, 101
   c 7.6, 5.8, 7.4, 8.1, 6.3, 6.7, 9.2, 8.5, 7.1

2 Barbara records her marks in a series of Spelling Tests in her school diary.
   7 5 6 9 8 7 6 6 7
   Unfortunately she cannot read the mark for the fourth test, because she smudged the mark as she wrote it down. She knows that her mean mark for the tests was 7. Find the mark covered by the smudge.

3 Sue is doing a traffic survey on the number of occupants in cars in a morning on a busy road. Her results are shown in a frequency table.

<table>
<thead>
<tr>
<th>Number of occupants</th>
<th>Frequency</th>
<th>Number × Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>113</td>
<td>2</td>
<td>226</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

   a Copy and complete the table.
   b Find the mean for the number of occupants.

4 Phil has five cards with numbers on. The median of the numbers is 7, the mean of the numbers is 6 and the range of the numbers is 9. What are the missing numbers on the three cards.

   1 3 ? ? ?

LESSON 5.3

1 The bar chart shows the number of students who were late for school in each year group on a particular day.

   a How many students were late in Year 10?
   b How many students were late altogether?
   c What percentage of students were late if there are 1000 pupils at the school?

2 The dual bar chart shows the lengths of 100 words in two different newspaper passages.

   a What is the modal word length for each newspaper?
   b How many words have more than six letters in i Guardian ii Mirror?
   c Compare the length of words for the two newspapers.

3 The pie chart shows the ages of people in a village.

   a What is the modal class for the ages of the people?
   b Approximately how many people are aged between 60 and 79, if there are 600 people in the village?
   c Would you expect the proportions of age groups to be similar if a pie chart were drawn for the people in a city? Explain your answer.
LESSON 5.4

All answers should be given as fractions.

1 Ella is playing a game using this fair five-sided spinner. What is the probability that she scores:
   a 7    b 1 or 9    c an odd number    d an even number    e not a multiple of 3?

2 The sample space diagram shows the outcomes when a fair dice and a fair coin are thrown together.
   a Copy and complete the sample space diagram.
   b Use the diagram to find each of the following probabilities.
      i \( P(6) \)    ii \( P(\text{a Head}) \)    iii \( P(4 \text{ and a Tail}) \)    iv \( P(\text{odd score and a Head}) \)

LESSON 5.5

1 The frequency table shows the results of throwing a dice 30 times.

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

   a Calculate the experimental probability for each score.
   b Comment on whether you think the dice is a fair one.

2 Pauline throws two fair coins 40 times. Her results are shown in the following frequency table.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Heads</td>
<td>10</td>
</tr>
<tr>
<td>2 Tails</td>
<td>12</td>
</tr>
<tr>
<td>1 Head and 1 Tail</td>
<td>18</td>
</tr>
</tbody>
</table>

   a Calculate the experimental probability of getting
      i 2 Heads    ii 2 Tails    iii 1 Head and 1 Tail
   b What do you think is the theoretical probability of getting 1 Head and 1 Tail when throwing two coins?

3 A biased spinner has four coloured sections.

   Douglas wants to find the experimental probability of getting each colour. He spins it 100 times and records his results in a frequency table.

<table>
<thead>
<tr>
<th>Colour</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>blue</td>
<td>30</td>
</tr>
<tr>
<td>red</td>
<td>40</td>
</tr>
<tr>
<td>green</td>
<td>10</td>
</tr>
</tbody>
</table>

   a Copy and complete the frequency table.
   b Calculate the experimental probability for each colour.
LESSON 6.1

1. Write down the values of each expression for the three values of \( n \).
   \[
   \begin{align*}
   a & \quad 2n + 3 & \text{where} & \quad i \ n = 3 & \quad ii \ n = 4 & \quad iii \ n = 5 \\
   b & \quad 4n - 1 & \text{where} & \quad i \ n = 5 & \quad ii \ n = 6 & \quad iii \ n = 7 \\
   c & \quad 10 - 2n & \text{where} & \quad i \ n = 4 & \quad ii \ n = 3 & \quad iii \ n = 1
   \end{align*}
   \]

2. Write down the values of each expression for the three values of \( n \).
   \[
   \begin{align*}
   a & \quad n^2 - 3 & \text{where} & \quad i \ n = 2 & \quad ii \ n = 3 & \quad iii \ n = 4 \\
   b & \quad n^2 + 4 & \text{where} & \quad i \ n = 5 & \quad ii \ n = 6 & \quad iii \ n = 7 \\
   c & \quad 2 + n^2 & \text{where} & \quad i \ n = 8 & \quad ii \ n = 9 & \quad iii \ n = 10
   \end{align*}
   \]

LESSON 6.2

1. In each of the following lists, write down all the expressions that equal each other.
   \[
   \begin{align*}
   a & \quad 6 + 7, 7 \times 6, 7 - 6, 6 \times 7, 7 + 6, 6 \div 7 \\
   b & \quad xy, x + y, y - x, yx, \frac{x}{y}, y + x, x \times y
   \end{align*}
   \]

2. Write down two more facts that are implied by each of the following statements.
   \[
   \begin{align*}
   a & \quad 4 + 7 = 11 & \quad b & \quad d + f = 8 & \quad c & \quad 4 \times 5 = 20 & \quad d & \quad xy = 18
   \end{align*}
   \]

3. Show by substitution of suitable numbers that:
   \[
   \begin{align*}
   a & \quad m + n + p = p + n + m & \quad b & \quad abc = cba & \quad c & \quad t - m \neq m - t
   \end{align*}
   \]

LESSON 6.3

1. Simplify each of the following expressions.
   \[
   \begin{align*}
   a & \quad 3x + 4y + 2x + 5y & \quad b & \quad 4w + 5t - 3w - t & \quad c & \quad 5m + 6n + 2m - n \\
   d & \quad 2x + 7y - y - x & \quad e & \quad 9 + 5x - 3 + 7x & \quad f & \quad 7p + 8 - 2p - 5 \\
   g & \quad y + 3x - 7 + 2x - y & \quad h & \quad 6d + 7c - 4c + 6 & \quad i & \quad 5f + 9 + 2d - 7 - f
   \end{align*}
   \]

2. Expand each of the following.
   \[
   \begin{align*}
   a & \quad 3(x + 5) & \quad b & \quad 2(t + 5) & \quad c & \quad 4(2m + 3) & \quad d & \quad 5(w - 1) & \quad e & \quad 5(2m - 3) \\
   f & \quad 6(3q - 2) & \quad g & \quad 3(2x - 5) & \quad h & \quad 5(t + 6) & \quad i & \quad 6(4b + 3) & \quad j & \quad 3(4x - 1) \\
   k & \quad 8(2t - 3) & \quad l & \quad 4(5t - 1)
   \end{align*}
   \]

3. Expand and simplify each of the following expressions.
   \[
   \begin{align*}
   a & \quad 3(x + 4) + 2(x + 5) & \quad b & \quad 3(p + 5) + 4(p + 7) & \quad c & \quad 4(w + 5) + 3(w - 1) \\
   d & \quad 4(d - 1) + 5(d + 6) & \quad e & \quad 2(7p + 3) + 4(3p + 2) & \quad f & \quad 2(5m + 4) + 4(6m - 1)
   \end{align*}
   \]
LESSON 6.4

Homework

1 Write each of these rules as a formula. Use the first letter of each variable in the formula (printed in bold type).

   a The cost of renting out a hut is £5 per day.
   b The cost of a journey is £2 for every mile travelled.
   c The distance is 70 times the number of hours travelled.
   d Mum’s age is always Joe’s age plus 39.

2 An engineer uses the formula \( t = 30 + 20k \), where \( t = \) time in minutes and \( k = \) number of items to be made. Calculate the time for the engineer to make:

   a 5 items        b 3 items        c 8 items

3 The formula for the cost of a TV advert is \( C = 90P + 150T \), where \( C \) is the charge in £, \( P \) is the number of people used and \( T \) is the number of seconds the advert lasts. Use the formula to calculate the charge for the following adverts.

   a 3 people, lasting 10 seconds        b 1 person, lasting 15 seconds
   c 8 people, lasting 6 seconds        d 20 people, lasting 9 seconds

LESSON 6.5

Homework

Solve each of the following equations.

   a \( 2x = 10 \)        b \( x + 4 = 10 \)        c \( x - 1 = 9 \)        d \( 4x = 24 \)
   e \( m - 2 = 17 \)        f \( m + 4 = 9 \)        g \( 7m = 63 \)        h \( 2m - 5 = 7 \)
   i \( 5k + 1 = 21 \)        j \( 4k - 3 = 9 \)        k \( 2k - 1 = 15 \)        l \( 3k + 5 = 23 \)
   m \( 6x - 4 = 26 \)        n \( 3x + 7 = 22 \)        p \( 4x + 5 = 29 \)        q \( 8x - 4 = 44 \)

CHAPTER 7

Shape, Space and Measures 2

LESSON 7.1

Homework

1 Copy and complete each of the following.

   a FG is parallel to …
   b BC is parallel to …
   c DE is perpendicular to …
   d AG is perpendicular to …

2 Copy and complete each of the following:

   a \( a \) and \( e \) are …… angles
   b \( d \) and \( e \) are …… angles
   c \( d \) and \( h \) are …… angles
   d \( c \) and \( f \) are …… angles
## LESSON 7.2

### Homework

1. Calculate the size of each unknown angle.
   - ![Triangle with angles 62°, 34°, and unknown angle](image)
   - ![Triangle with angles 25°, 40°, and unknown angle](image)
   - ![Triangle with angles 63°, 40°, and unknown angle](image)

2. Calculate the size of each unknown angle.
   - ![Triangle with angles 143°, unknown angle, and 32°](image)

3. Calculate the size of each unknown angle.
   - ![Quadrilateral with angles 100°, 85°, 120°, and unknown angle](image)
   - ![Triangle with angles 74°, 58°, and unknown angle](image)
   - ![Triangle with angles 67°, 63°, and unknown angle](image)

## LESSON 7.3

### Homework

1. Write down the coordinates of the points P, Q, R and S on the grid.
2. a. Draw a grid as in Question 1 and plot the points A(1, 4), B(5, 4), C(5, 1) and D(1, 1).
   b. Join the points to form the rectangle ABCD.
   c. What are the coordinates of the mid-point of AB?

3. Write down the coordinates of the points A, B, C, D, E, F, G and H on the grid.
4. a. Draw a grid as in Question 3 and plot the points P(1, 4), Q(4, 2) and R(1, –4)
   b. The points form three vertices of a kite PQRS. Plot the point S and draw the kite.
   c. Write down the coordinates of the point S.
LESSON 8.1

a Find two dice.
b Roll the two dice together. Which total number do you get most often – and why?
c Roll the two dice 100 times and keep a tally of the results.
d Draw a chart illustrating your results.
e Give some reasons why you got the results you did.

LESSON 8.2

Choose a book you have at home. Count the number of words in 100 sentences and create a bar chart illustrating your results.

LESSON 8.3

Estimate how long half a minute is.
a Find a clock or a watch that has a seconds hand, or allows you to time 30 seconds. (Better still, use a stopwatch if you have one.)
b Wait for the minute hand to get to the beginning of a minute, shut your eyes, and open them when you think half a minute has gone. Look straight away at the watch and see for how many seconds you had your eyes shut. Write this figure down.
c Repeat this 20 or 30 times. Then put your results into a suitable grouped frequency table.
d Draw a frequency diagram from your results.

LESSON 8.4

Choose a particular 30-minute spell to look at all the vehicles that pass your house, or the end of your street. Take a survey of the number of passengers in each vehicle, the colour of each vehicle, the type of vehicle (car, van, bus, bike) and, when it is a car, whether it has two doors or four doors.

Analyse your data and give at least two conclusions from the data.
LESSON 9.1

1. Round off these numbers to i the nearest 10 ii the nearest 100 iii the nearest 1000.
   a 2786       b 321       c 4511       d 921       e 1835

2. Round off these numbers to i the nearest whole number ii one decimal place iii two decimal places.
   a 3.362       b 1.947       c 0.921       d 2.459       e 2.708

3. a i What are the lengths of these worms to the nearest cm?
   ii Estimate their length to the nearest mm.
      a
      13 14 15 16 17 cm
      b
      18 19 20 21 22 cm

LESSON 9.2

1. a To raise money, Wath Running Club are doing a relay race from Wath to London. Each runner will run 24 miles. How many runners will be needed to cover the distance?
   b Sponsorship will bring in £72.50 per mile. How much money will be raised?

2. Find the sum and product of a 49, 2 and 7 b 12, 5 and 30

3. a Find three consecutive even numbers that have a sum of 42.
   b Find two consecutive odd numbers that have a product of 143.
   c Why can you not find two consecutive odd numbers that have a sum of 29?

LESSON 9.3

1. Circle the operation that you do first in each of these calculations. Then work it out.
   a 3 + 4 × 6       b (3 + 4) × 6       c 24 − 8 ÷ 4       d (24 − 8) ÷ 4

2. Work out each of the following, showing each step of the calculation.
   a 12 − 2 × 5       b (12 − 2) × 5       c (2 + 4) × (5 − 3)       d 3² + 5 − 2
   e 3 × (2² + 1)       f (3 + 2)² + 1

3. Put brackets in each of the following to make the calculation true.
   a 2 + 6 × 3 = 24       b 3 + 1² − 6 = 10       c 36 ÷ 12 − 6 = 6

4. Explain clearly why 3 × 2² is not 36.
LESSON 9.4

1 Work out each of the following using any method you are happy with.
   a $45 \times 54$  b $176 \times 26$  c $912 \div 38$  d $900 \div 29$

2 a A baker bakes buns in trays that hold 32 buns. He has 27 such trays. How many buns can he bake at one time?
   b The baker has 924 rolls which he is packing in bags of 13. How many bags will he need? Will there be any rolls left over?

LESSON 9.5

1 First, estimate the answer to each of the following calculations. Then use your calculator to work out each answer. Round off your answer to 1 decimal place if necessary.
   a $\frac{368 + 103.5}{23 + 18}$  b $\frac{703 + 168}{54 - 21}$  c $\frac{803 - 397}{T32 - 88}$

2 a Explain how you know that the answer to $23^2$ is between 400 and 900.
   b Without using a calculator, write down two multiples of 100 that 372 is between.
   c Use your calculator to work out  i $23^2$  ii $37^2$

3 Use your calculator to work out
   a $\sqrt{5.29}$  b $2.3^2 - (7.9 - 3.2)$  c $(2.45 - 1.63)^2$

LESSON 9.6

1 Convert:
   a 45 cm to mm  b 345 g to kg  c 356 cl to litres  d 75 min to hours and minutes
   e 0.037 km to m  f 7 km to mm

2 What unit would you use to measure each of these?
   a Capacity of a can of pop  b Weight of a bag of sweets  c Length of a finger
   d Weight of a caravan?

3 Add together each of the following and give your answer in an appropriate unit.
   a 1.23 m, 56 cm, 598 mm  b 367 cl, 4.2 l, 6503 ml

LESSON 9.7

Write up your investigation of Mathematical Mice, explaining clearly what you have done and recording your results clearly.

This can be done as a wall display or a poster.

Remember that if another person reads your work, that person should understand exactly what the problem is and exactly what you have done to find out the answer.

Your reader should also see clearly what the answer is.
**LESSON 10.1**

\[ \sqrt{900} = \sqrt{9} \times \sqrt{100} = 30 \]

a Use a calculator to check that the above statement is true.

b Use a similar routine to find 
   i \( \sqrt{400} \)
   ii \( \sqrt{2500} \)
   iii \( \sqrt{1600} \)
   iv \( \sqrt{4900} \)

c Use a calculator to check that each one is correct.

d Write down the number representing \( \sqrt{1000000} \)

e Without a calculator, find each of these.
   i \( \sqrt{9000000} \)
   ii \( \sqrt{4000000} \)
   iii \( \sqrt{81000000} \)
   iv \( \sqrt{64000000} \)

f Explain why there is no quick way to find the square roots of thousands. For example:
\[ \sqrt{4000} \text{ or } \sqrt{9000} \]

**LESSON 10.2**

Look at this arrangement of triangle numbers. Each diagram is made up of a triangle number and a copy of it put on top to make a rectangle.

The size of each rectangle is given by:
\[ \text{Dots in a row} \times \text{Number of rows} \]

a Draw the next three shapes in the sequence.

b Write the size of the shapes you have just drawn.

c What would be the size of the 50th shape?

d What is the size of the \( n \)th shape?

e Try to use this to write down the \( n \)th triangle number.

**LESSON 10.3**

Create a graph from each of the following functions. Use the starting points given with each function.

a \( y = x + 5 \)  
\{-1, 0, 1, 2, 3\}

b \( y = 2x + 1 \)  
\{-1, 0, 1, 2\}

c \( y = 3x + 2 \)  
\{-1, 0, 1, 2\}

d \( y = 4x - 3 \)  
\{-1, 0, 1, 2, 3\}
LESSON 10.4

1a Draw each of the following graphs on the same grid, and label it.
   - i $y = 2$
   - ii $y = 7$
   - iii $y = 4.5$
   - iv $x = 3$
   - v $x = 1.5$
   - vi $x = 9$

1b Write the coordinates of the point where each of the following pairs of lines cross.
   - i $y = 5$ and $x = 2$
   - ii $y = 3$ and $x = 7$
   - iii $y = 15$ and $x = 17$

2 Draw each of the following graphs on a different pair of axes.
   - a $y = 3x$
   - b $y = 2x - 1$
   - c $y = 3x + 2$

LESSON 10.5

1a Is the point (5, 9) on the graph of $y = x + 4$?
   - b Is the point (4, 2) on the graph of $y = 2x$?
   - c Is the point (3, 5) on the graph of $y = 8 - x$?

2 Which of the following lines does the point (1, 4) lie on?
   - a $y = x + 3$
   - b $y = x + 4$
   - c $y = 3x$
   - d $y = 4x$
   - e $y = 4$

3 Write down two functions whose graphs will pass through the point (2, 10).

4 Find, by drawing the two graphs, the coordinates of the point where the graphs of $y = x + 4$ and $y = 10 - x$ intersect. (Both the $x$-axis and the $y$-axis from 0 to 10.)
LESSON 11.1

1 Measure the size of each of the following angles to the nearest degree.

2 Draw and label each of the following angles.

   a 25°  b 82°  c 135°  d 172°  e 250°  f 338°
LESSON 11.2

1 Construct each of the following triangles. Remember to label every line and angle you have drawn.

![Triangle A]
- AB: 8.2 cm
- BC: 9.2 cm
- AC: 68°

![Triangle B]
- DE: 12.5 cm
- EF: 8.8 cm
- DF: 38°

![Triangle C]
- GH: 5.2 cm
- HI: 7.5 cm
- GI: 6.4 cm

2 a Construct the triangle PQR with PQ = 7.5 cm, PR = 5.2 cm and ∠P = 54°.
   b Measure the length of the side QR to the nearest millimetre.
   c Bisect ∠P, showing all your construction lines.

3 a Construct the triangle XYZ with YZ = 9.6 cm, ∠Y = ∠Z = 55°.
   b Measure the size of ∠X to the nearest degree.
   c Calculate the size of ∠X to check your answer to part b.
   d Construct the perpendicular bisector of YZ, showing all your construction lines.

LESSON 11.3

1 Explain why a triangle cannot have a reflex angle.
2 Which types of quadrilateral can have exactly two right angles?
3 Draw sketches of three types of quadrilateral which can contain two obtuse angles.
4 These two shapes make a rectangle when they are put together. What other shapes can you make from them? You may want to make copies of the shapes to help.

CHAPTER 12

Teacher’s Pack 3 Homework

Number 4

LESSON 12.1

1 Without a calculator work out each of the following.
   a 21% of 650
   b 29% of 46
   c 98% of 234

2 Work out each of these.
   a 17% of £406
   b 34% of 1850 students
   c 86% of 86 glasses

3 Which is greater
   a 14% of 65 or 64% of 15?
   b 63% of 117 or 41% of 171?
LESSON 12.2

1. What proportion of the metre rule is shaded?
   a

2. What proportion of the metre rule is unshaded?
   b

3. What is the ratio of shaded to unshaded rule?
   c

2. Three cans of coke cost £1.05. How much do
   a 9 cans cost?  b 15 cans cost?

3. The ratio of boys to girls in a class is 2 : 3. There are 10 boys in the class. How many girls are there?

LESSON 12.3

1. Reduce each of the following ratios to their simplest form.
   a 2 : 8  b 3 : 15  c 12 : 20  d 9 : 18  e 15 : 20  f 18 : 30

2. Write down the ratio of grey : white from each of these metre rules.
   a

3. There are 200 passengers on an aircraft. 120 are British, 40 are French, 24 are German and the rest are Italian.
   a Write down the percentage of each nationality on the aircraft.
   b Write down each of the following ratios in their simplest form.
      i British : French  ii French : German  iii German : Italian

LESSON 12.4

1. Divide £150 into each of these ratios.
   a 2 : 3  b 1 : 9  c 2 : 1  d 1 : 3

2. There are 1200 pupils in a secondary school. The ratio of girls to boys is 5 : 7.
   How many boys and girls are there in the school?

3. Alf has 90 budgies. The ratio of yellow birds to blue birds is 4 : 5. How many of each colour are there?
LESSON 13.1

Find the unknown number $x$ in each of these ‘brick wall’ problems.

1. $11 \quad x \quad 6$
2. $14 \quad x \quad 8$
3. $2x \quad x \quad 3x$
4. $x + 3 \quad x \quad x + 5$

LESSON 13.2

Find the solution set to the square-and-circle puzzle shown on the right.

Each solution must use four different positive integers.

LESSON 13.3

1. The sum of four consecutive even numbers is 124. What are the numbers?
2. I am four times as old as my daughter. She was born when I was 39. How old am I now?
3. I bought four cups of tea and five buns. Each bun was 10p more than a cup of tea. These altogether cost me £5. How much was a cup of tea?
LESSON 14.1

1 The logos below can be seen on different makes of cars. Sketch each logo and draw its lines of symmetry.

a Mazda  
b Mercedes  
c Volkswagen  
d Toyota  
e Mitsubishi  
f Honda  

2 Draw, on squared paper, two copies of the diagram on the right.
   a On one copy shade in one more square so that the diagram has two lines of symmetry.
   b On the other copy shade in three more squares so that the diagram has four lines of symmetry.

3 Write down the order of rotational symmetry for each of the following shapes.
   a  
b  
c  
d  
e  
f  

4 Copy the diagram and shade in one more square so that it has rotational symmetry of order 2 and no lines of symmetry.

LESSON 14.2

1 Copy each of these shapes onto squared paper. Then reflect each one in the mirror line.

a  
b  
c  
d  

2 a How many lines of symmetry does an isosceles triangle have?
   b Copy the diagram on the right, and reflect the triangle in the mirror line.
   c What is the name of the quadrilateral formed by this reflection?
   d How many lines of symmetry does this quadrilateral have?
LESSON 14.3

Copy each of the shapes below on squared paper. Draw the image after each one is rotated about the point marked X through the angle indicated. Use tracing paper to help.

1. 90° clockwise
2. 90° anticlockwise
3. 180° clockwise
4. 270° clockwise

LESSON 14.4

1. Describe each of the following translations:
   a. A to B
   b. A to C
   c. B to D
   d. C to B
   e. D to A

2. Copy the diagram on squared paper.
   a. Write down the coordinates of A, B, C and D.
   b. Translate the rectangle ABCD 4 units left and 5 units up to form the image rectangle A’B’C’D’.
   c. Write down the coordinates of A’, B’, C’ and D’.
   d. What translation maps the rectangle A’B’C’D’ onto the rectangle ABCD?
LESSON 14.5

1. Draw copies of the following shapes below and enlarge each one by the given scale factor about the centre of enlargement $O$.
   - Scale factor 2
   - Scale factor 3
   - Scale factor 2

2. Copy the shapes on the right onto centimetre squared paper and enlarge each one by the given scale factor about the origin $O$.
   - Scale factor 2
   - Scale factor 3

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CHAPTER 15

Handling Data 3

LESSON 15.1

1. Draw pie charts to represent the following data
   - The favourite TV programme of 30 adults.
     | Subject       | News | Soaps | Documentaries | Drama |
     |---------------|------|-------|---------------|-------|
     | Frequency     | 8    | 12    | 6             | 4     |
   - The ages of 60 teachers in a school.
     | Age           | 21–30| 31–40 | 41–50 | 51–60 | Over 60 |
     | Frequency     | 11   | 19    | 17    | 8     | 5       |
   - The favourite hobbies of 24 pupils.
     | Hobby         | Sport| Computing | Games console | Music | Other |
     | Frequency     | 4    | 5       | 8         | 5     | 2      |
LESSON 15.2

1  You have to pick someone to represent your class in a spelling quiz.
   These are the numbers of correct spellings (out of 10) for two students on some practice quizzes.

<table>
<thead>
<tr>
<th></th>
<th>Tom</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Dick</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

   a  Work out the mean for Tom
   b  Work out the range for Tom
   c  Work out the mean for Dick
   d  Work out the range for Dick
   e  Who would you pick for the quiz and why?

2  You always have chips for lunch. Mary and Ann serve chips. You count how many chips they give you in a week.

<table>
<thead>
<tr>
<th></th>
<th>Mary</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>23</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>18</td>
<td>26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Ann</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
<td>35</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Which person would you want to serve you with chips and why?

3  Look at each set of data and decide whether the range is suitable or not. Explain your answer.
   a  2, 3, 6, 8, 9, 10
   b  1, 1, 1, 1, 20
   c  2, 2, 4, 6, 8
   d  1, 2, 5, 7, 8, 9
   e  1, 2, 2, 8, 9, 9, 20

LESSONS 15.3 and 15.4

Homework can be used by students either to collect further data, or to complete their reports.

The following problems could be started at home if time is available.

1  Investigate the amount of space that is given to advertising in different newspapers.

2  Investigate the amount of time that is devoted to sport on TV.

LESSON 15.5

Heather, Kathryn and Pat each rolled a fair dice 120 times. The frequency table shows their results.

<table>
<thead>
<tr>
<th>Score</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heather</td>
<td>24</td>
<td>21</td>
<td>15</td>
<td>25</td>
<td>46</td>
<td>19</td>
</tr>
<tr>
<td>Kathryn</td>
<td>19</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Pat</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Only one of the girls had recorded their results accurately. Which two girls had recorded their results inaccurately? Give a reason for your answer.
**LESSON 16.1**

1. Without using a calculator write down:
   - a. \(0.9 \times 0.8\)
   - b. \(0.7 \times 0.7\)
   - c. \(0.6 \times 0.5 \times 0.2\)

2. Without using a calculator write down:
   - a. \(400 \times 0.7\)
   - b. \(600 \times 0.03\)
   - c. \(700 \times 0.5 \times 0.6\)

3. Widgets cost £0.07 each. How much will 3 million widgets cost?

4. A litre of milk contains 0.000 003 grams of Arsenic, which is a poison.
   2 grams of Arsenic are enough to kill someone.
   How many people could be killed by the Arsenic contained in 5 million litres of milk?

**LESSON 16.2**

1. Without using a calculator, work out:
   - a. \(0.6 \div 0.03\)
   - b. \(0.9 \div 0.3\)
   - c. \(0.08 \div 0.1\)
   - d. \(0.12 \div 0.03\)

2. Without using a calculator, work out:
   - a. \(400 \div 0.4\)
   - b. \(300 \div 0.6\)
   - c. \(500 \div 0.05\)
   - d. \(200 \div 0.05\)

3. Without using a calculator, work out:
   - a. \(2.4 \div 20\)
   - b. \(3.2 \div 400\)
   - c. \(16 \div 400\)
   - d. \(36 \div 90\)

4. In a charity event it was decided to put a line of pennies from Leeds to Sheffield, a distance of 40 km. Each penny is 0.01 m wide. How much money would be raised?
**LESSON 16.4**

1. Find
   - a) \(\frac{1}{4}\) of £65
   - b) \(\frac{1}{2}\) of 70 kg
   - c) \(1\frac{1}{2}\) of 25 m
   - d) \(1\frac{1}{2}\) of 66 daffodils

2. Find as a mixed number:
   - a) \(7 \times \frac{1}{2}\)
   - b) \(5 \times \frac{1}{3}\)
   - c) \(4 \times 2\frac{1}{3}\)
   - d) \(3 \times \frac{1}{4}\)

3. There are 390 pupils in a primary school. \(\frac{3}{4}\) of them are boys. How many girls are there in the school?

4. A house brick weighs \(\frac{2}{3}\) kilogram. How much will seven bricks weigh?

5. In a herd of 180 cows, \(\frac{1}{3}\) are Jerseys. How many Jersey cows are there?

**LESSON 16.5**

1. Copy and complete this table.

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decimal</td>
<td>0.15</td>
<td>0.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fraction</td>
<td>1/5</td>
<td>2/3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>42%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Without a calculator, work out each of these.
   - a) 15% of £280
   - b) 40% of 60 sweets
   - c) 45% of £5.60

3. In a sports store, there are 320 balls. 25% of them are footballs, 35% are tennis balls, 15% are basketballs, 5% are hockey balls and the rest are rugby balls.
   - a) What percentage are rugby balls?
   - b) How many of each type of ball are there in the store?

**LESSON 16.6**

Complete the investigations, producing the answer to each on a poster for a wall display.
LESSON 17.1

Solve each of the following equations.

- \( a \quad 15x + 3 = 78 \)
- \( b \quad 12x + 4 = 148 \)
- \( c \quad 14x - 1 = 41 \)
- \( d \quad 17x - 3 = 167 \)
- \( e \quad 11m - 2 = 86 \)
- \( f \quad 15m + 4 = 214 \)
- \( g \quad 18m + 3 = 39 \)
- \( h \quad 15m - 5 = 235 \)
- \( i \quad 3(m + 2) = 18 \)
- \( j \quad 5(m - 1) = 25 \)
- \( k \quad 4(3m + 2) = 26 \)
- \( l \quad 2(x - 7) = 5 \)
- \( m \quad 5x - 2 = 3x + 7 \)
- \( n \quad 8x + 3 = 10 - 2x \)
- \( p \quad 4x - 3 = 5 - x \)

LESSON 17.2

1. The distance, \( D \) km, travelled by a train in time \( t \) hours, with an average speed of \( A \) km/h, is given by the formula \( D = At \).
   - \( a \) Use the formula to find the distance travelled in 5 hours at an average speed of 66 km/h.
   - \( b \) A train was travelling at an average of 48 km/h. How far did it travel on its journey of 7 hours?

2. The density, \( D \), is found by the formula \( D = \frac{M}{V} \).
   where \( M \) = mass in grams, and \( V \) = volume in cm\(^3\).
   Find the density of a rock with a mass of 855 grams and a volume of 45 cm\(^3\).

LESSON 17.3

Repeat the lesson investigations, but use an odd number of dots on the perimeter of each shape.
LESSON 17.4

Early in 2002 in the USA, the exchange rate for $1 was £0.64.

a Copy and complete the following table using this exchange rate.

<table>
<thead>
<tr>
<th>Dollar ($)</th>
<th>1</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pound (£)</td>
<td>0.64</td>
<td>6.40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b Use the data from this table to draw a conversion graph from pounds to US dollars.

c Use your graph to convert each of the following amounts to US dollars.
i £8  ii £24  iii £32.80

d Use your graph to convert each of the following amounts to pounds.
i $5  ii $15  iii $25

LESSON 17.5

Use algebra to solve these triangle-and-circle problems. All the solutions are integer.

1

2

A

9
C

10

B

A

4

C

13

B

−7
LESSON 18.1

1. Write down the name of each of the following polygons.
   a.  
   b.  
   c.  
   d.  

2. State whether each of the shapes below is a convex polygon or a concave polygon.
   a.  
   b.  
   c.  
   d.  

3. Draw a hexagon which has three interior reflex angles.

4. Find out the name of an 11-sided polygon and that of a 12-sided polygon.

LESSONS 18.2 and 18.3

1. Make a tessellation from each of the following shapes. Use a square grid or a triangular grid to help.
   a.  
   b.  
   c.  
   d.  

2. This shape is formed from a regular hexagon and an equilateral triangle.

   Copy the shape onto triangular paper. Show that it forms a tessellation.

3. Explain why a circle does not tessellate.
1. Which of the following are nets for a cube?
   a)  
   b)  
   c)  
   d)  

2. Which of the following are nets for a regular tetrahedron?
   a)  
   b)  
   c)  
   d)  

3. The sketch below is a net for a triangular prism. Write down the lengths of \( x \), \( y \), and \( z \).
   ![Triangular Prism Net]

   \( x \) = \( 8 \) cm
   \( y \) = 4 cm
   \( z \) = 4 cm
   \( x \) = 5 cm
   \( y \) = 5 cm
   \( z \) = 3 cm