Answer all the questions.

1 (a) (i) Measure angle $a$.

(a)(i) ........................................................ $^\circ$ [1]

(ii) Write down the mathematical name of this type of angle.

(ii) ........................................................... [1]

(b) Choose one of these words to complete the following sentence.

perpendicular   vertical   parallel   horizontal

These are ................................................. lines. [1]
2  (a) Use one of these symbols $<$, $>$ or $=$ to make each statement true.

(i)  $17.6 \quad \frown \quad 17.06$  

(ii) $0.9 \quad \frown \quad \frac{45}{50}$  

(b) Round 184329 to the nearest hundred.

(b) ..........................................................  

(c) Write $\frac{5}{8}$ as a decimal.

(c) ..........................................................  

3  Here is a list of numbers.

11  27  81  21  41  42  23  39  45  

From this list, write down

(a) the even number,

(a) ..........................................................  

(b) the square number,

(b) ..........................................................  

(c) all the prime numbers.

(c) ..........................................................
Karen made 40 cakes.

She gives \( \frac{1}{5} \) of the cakes to Andrew.

She gives 10% of the 40 cakes to Chris.

What fraction of the 40 cakes does she have left?
Points $P$ and $Q$ are shown on this grid.

(a) (i) Write down the coordinates of point $P$.

(a)(i) $(.......................... , ..........................)$ [1]

(ii) Write down the coordinates of point $Q$.

(ii) $(.......................... , ..........................)$ [1]

(b) Plot point $R$ at $(3, -2)$. [1]

(c) Draw the line $y = 3$ on the grid. [1]
6 Work out 17% of 54.
Give your answer correct to 1 decimal place.

7 (a) Simplify.
\[ 7t - 6u + 5t - 4u \]

(a) ........................................................... [2]

(b) Factorise.
\[ 5v + 20w \]

(b) ........................................................... [1]

(c) Solve by factorising.
\[ x^2 + 10x + 21 = 0 \]

(c) \( x = \) ................. or \( x = \) ................. [3]
Apple crumble is made using these ingredients.

<table>
<thead>
<tr>
<th>Apple crumble</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serves 6 people</td>
</tr>
<tr>
<td>550 g apple</td>
</tr>
<tr>
<td>200 g sugar</td>
</tr>
<tr>
<td>120 g flour</td>
</tr>
<tr>
<td>30 g butter</td>
</tr>
</tbody>
</table>

(a) Susumu makes apple crumble to serve 12 people.
How much flour should he use?

(a) ........................................................ g [1]

(b) Natalie makes apple crumble for 2 people.
How much butter should she use?

(b) ........................................................ g [1]

(c) Abena has 1.3 kg of apples and plenty of the other ingredients.
Can she make apple crumble for 15 people?
Explain how you got your answer.

.............................................................................................................................................. [4]
Jorge recorded the scorers of 120 goals. He started to draw a pie chart to show the results.

(a) How many goals did Simon score?

(b) The table shows the other players who scored goals.

<table>
<thead>
<tr>
<th>Name of scorer</th>
<th>Number of goals</th>
<th>Angle of sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wayne</td>
<td>48</td>
<td>144°</td>
</tr>
<tr>
<td>Harry</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Obi</td>
<td></td>
<td>72°</td>
</tr>
<tr>
<td>Antony</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(i) Complete the table.  
(ii) Complete the pie chart.
10 The pass mark for a test is 86%.
   Steve scores 52 out of 61 marks.

   Does he pass the test?
   Explain your answer.

11 320 people go on a coach trip.
    Each coach holds 53 people.

    Gary says 6 coaches are needed.

    Is Gary correct?
    You must show your working.

12 Trish and Marc both cycled the same distance.
    Trish completed the distance in 2 hours.
    Her average speed was 16 miles per hour.
    Marc completed the distance in 4 hours.

    Find Marc's average speed for the journey.
13  (a) The ratio 20 minutes to 1 hour can be written in the form $1 : n$.

Find the value of $n$.

(a) $n =$ .................................................... [1]

(b) The scale on a map is $1 : 25000$.

How many kilometres on the ground is represented by 6 cm on the map?

(b) ..................................................... km [3]

(c) Kiri and Peter share some sweets in the ratio $6 : 7$.

What fraction of the sweets does Kiri receive?

(c) ........................................................... [1]
14 (a) Write 543 000 in standard form.

(a) ........................................................... [1]

(b) Write $6.3 \times 10^{-2}$ as an ordinary number.

(b) ........................................................... [1]

(c) Pierre is given this question.

Work out.
61000 × 4000
Give your answer in standard form.

Pierre's answer is $24.4 \times 10^7$.

Is Pierre correct?
Explain your answer.

...................................................................................................................................................
...................................................................................................................................................
................................................................................................................................................... [1]
Mr and Mrs Thomas buy tickets for themselves and their four children. The cost of an adult ticket is £7 more than the cost of a child ticket. The total cost of the six tickets is £86.

Work out the cost of an adult ticket.

£ ................................................................ [5]
The scale diagram shows the positions of town A and town B.

Scale: 1 cm represents 10 miles

Lucy’s house is nearer to town A than to town B. Her house is exactly 50 miles from town B.

On the scale diagram show all the possible positions of Lucy’s house. You must show all your construction lines.
At the start of 2014 Priya's house was worth £240 000. The value of her house increased by 5% every year. Work out the value of her house at the start of 2017.

£ ........................................................... [3]

(a) Write 490 as the product of its prime factors.

(a) .......................................................... [2]

(b) Buses to Ayton leave the station every 25 minutes. Buses to Bleeford leave the station every 40 minutes. Buses to both places leave at 9am. What is the next time buses to Ayton and Bleeford leave the station together?

(b) ........................................................... [4]
Kirsty either travels by bus or walks when she visits the shops. The probability that she catches the bus to the shops is 0.3. The probability that she catches the bus from the shops is 0.8.

(a) Complete the tree diagram.  

(b) Show that the probability that Kirsty walks at least one way is 0.76.
Mo’s tyre pressure gauge shows a reading which is 12\% higher than the actual pressure.

What is the actual pressure when Mo’s gauge shows 38.64?
The diagram shows a semi-circle inside a rectangle of length 120 m. The semi-circle touches the rectangle at A, B and C.

Not to scale

Calculate the perimeter of the shaded region.
Give your answer correct to 3 significant figures.

...................................................... m [5]
22 A, B, C and D are four towns.

B is 25 kilometres due East of A.
C is 25 kilometres due North of A.
D is 45 kilometres due South of A.

(a) Work out the bearing of B from C.

(b) Calculate the bearing of D from B.
The table shows the average number of customers per day entering a shop.

<table>
<thead>
<tr>
<th>Months</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan-Mar</td>
<td>Apr-Jun</td>
</tr>
<tr>
<td>Average number of customers per day</td>
<td>119</td>
<td>264</td>
</tr>
</tbody>
</table>

(a) Complete the time series graph below.

(b) Make two different comments comparing the number of customers entering the shop in 2015 and 2016.

Comment 1 ...................................................................................................................................................
...................................................................................................................................................
...................................................................................................................................................

Comment 2 ...................................................................................................................................................
...................................................................................................................................................
...................................................................................................................................................
Each week Dan drives two routes, route X and route Y.

One week he drives route X three times and route Y twice. He drives a total of 134 miles that week.

Another week he drives route X twice and route Y five times. He drives a total of 203 miles that week.

(a) Find the length of each route.

(b) State an assumption that has been made in answering part (a).