1 Write down a prime number between 20 and 30.

.........................................[1]

2 Write 0.000 038 7 in standard form.

.........................................[1]

3 Write the recurring decimal 0.63 as a fraction.

.........................................[1]

4 Find the value of $7x + 3y$ when $x = 12$ and $y = -6$.

.........................................[2]

5 The diagram shows two parallel lines $PAQ$ and $SBCT$.
$AB = AC$ and angle $QAC = 43^\circ$.

Find the value of $x$.

$x = .........................................[2]$
6 Calculate the area of a circle with radius 5.1 cm.

\[ \text{.................................cm}^2 \quad [2] \]

7 Calculate the length of \( AC \).

\[ AC = \text{................................. cm} \quad [2] \]

8 Expand and simplify.

\[ 6(2y - 3) - 5(y + 1) \]

\[ \text{.................................} \quad [2] \]

9 \( 3^{-q} \times \frac{1}{27} = 81 \)

Find the value of \( q \).

\[ q = \text{.................................} \quad [2] \]
10 (a) Calculate \( \sqrt{2.38 + 6.4^2} \), writing down your full calculator display.

..............................................[1]

(b) Write your answer to part (a) correct to 4 decimal places.

..............................................[1]

11 Find the exact value of \( 8^{\frac{1}{2}} \times 49^{-\frac{1}{2}} \).

..............................................[2]

12 Solve the inequality.

\[ 3n - 5 > 17 + 8n \]

..............................................[2]
13  Without using your calculator, work out \( \frac{3}{4} \times \frac{6}{35} \).

You must show all your working and give your answer as a fraction in its simplest form.

\[ \frac{\text{...}}{\text{...}} \]

14

Use the sine rule to find angle \( ABC \).

\[ \text{Angle } ABC = \frac{\text{...}}{\text{...}} \]
15 \( y \) is directly proportional to \((x - 1)^2\).
When \( x = 5 \), \( y = 4 \).

Find \( y \) when \( x = 7 \).

\[ y = \quad \text{..............................................} \; [3] \]

16

[Diagram]

On the grid, draw the image of shape \( R \) after the transformation represented by the matrix \( \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \). \; [3]
The speed–time graph shows information about the journey of a tram between two stations.

(a) Calculate the distance between the two stations.

..........................................m [3]

(b) Calculate the average speed of the tram for the whole journey.

.......................................... m/s [1]
The cumulative frequency diagram shows information about the time, \( m \) minutes, taken by 120 students to complete some homework.

Use the cumulative frequency diagram to find an estimate of

(a) the interquartile range, ....................................... \( \) min [2]

(b) the number of students who took more than 50 minutes to complete the homework. .............................................. [2]
Calculate angle $LMN$.

$\text{Angle } LMN = \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots[4]\$

20  (a) A box contains 3 blue pens, 4 red pens and 8 green pens only.
A pen is chosen at random from the box.

Find the probability that this pen is green.

$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots[1]\$

(b) Another box contains 7 black pens and 8 orange pens only.
Two pens are chosen at random from this box without replacement.

Calculate the probability that at least one orange pen is chosen.

$\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots[3]\$
There are four inequalities that define the region $R$. One of these is $y \leq x + 1$.

Find the other three inequalities.

..............................................
..............................................
..............................................
.............................................. \[4\]
22 \( f(x) = 5 - 2x \quad g(x) = x^2 + 8 \)

(a) Calculate \( f(-3) \).

..............................................[2]

(b) Find

(i) \( g(2x) \),

..............................................[1]

(ii) \( f^{-1}(x) \).

\( f^{-1}(x) = \) ..............................................[2]

23 40 people were asked how many times they visited the cinema in one month. The table shows the results.

<table>
<thead>
<tr>
<th>Number of cinema visits</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

(a) (i) Find the mode.

..............................................[1]

(ii) Calculate the mean.

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

(b) Omar wants to show the information from the table in a pie chart.

Calculate the sector angle for the people who visited the cinema 5 times.

..............................................[2]
24 (a) Point $A$ has co-ordinates $(1, 0)$ and point $B$ has co-ordinates $(2, 5)$.

Calculate the angle between the line $AB$ and the $x$-axis.

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

(b) The line $PQ$ has equation $y = 3x - 8$ and point $P$ has co-ordinates $(6, 10)$.

Find the equation of the line that passes through $P$ and is perpendicular to $PQ$.
Give your answer in the form $y = mx + c$.

$y = .............................................. [3]$