Formula List

Area, $A$, of triangle, base $b$, height $h$. \[ A = \frac{1}{2}bh \]

Area, $A$, of circle, radius $r$. \[ A = \pi r^2 \]

Circumference, $C$, of circle, radius $r$. \[ C = 2\pi r \]

Curved surface area, $A$, of cylinder of radius $r$, height $h$. \[ A = 2\pi rh \]

Curved surface area, $A$, of cone of radius $r$, sloping edge $l$. \[ A = \pi rl \]

Curved surface area, $A$, of sphere of radius $r$. \[ A = 4\pi r^2 \]

Volume, $V$, of prism, cross-sectional area $A$, length $l$. \[ V = Al \]

Volume, $V$, of pyramid, base area $A$, height $h$. \[ V = \frac{1}{3}Ah \]

Volume, $V$, of cylinder of radius $r$, height $h$. \[ V = \pi r^2h \]

Volume, $V$, of cone of radius $r$, height $h$. \[ V = \frac{1}{3}\pi r^2h \]

Volume, $V$, of sphere of radius $r$. \[ V = \frac{4}{3}\pi r^3 \]
3

Answer all the questions.

1 Work out.

\[ 5 \times 20 \div 4 \]

Answer \ ................................................................. [1]

2 (a)

Shape \(A\) is drawn on a 1 cm square grid.

Find the perimeter of shape \(A\).

Answer(a) ................................................................. cm [1]

(b) On the grid below, draw a different shape which has the same area as shape \(A\).
3 (a) Write down the value of \((-2)^3\).

\[ \text{Answer}(a) \]

(b) Simplify.

\[ \frac{-2 - (-8)}{2 + 8} \]

Give your answer as a fraction in its lowest terms.

\[ \text{Answer}(b) \]

4 A farmer picks a bunch of grapes.

He writes down

A the colour of the grapes
B the number of grapes
C the weight of the grapes
D which plant the grapes were picked from.

(a) Which one of A, B, C or D is discrete data?

\[ \text{Answer}(a) \]

(b) Which one of A, B, C or D is continuous data?

\[ \text{Answer}(b) \]
5  Niki began a race at 10:05.
She finished the race at 16:05.

(a)  How many hours did Niki take to complete the race?

\[ \text{Answer (a)} \] .......................................................... h [1]

(b)  The distance of the race was 42 km.

Work out Niki’s average speed.

\[ \text{Answer (b)} \] .......................................................... \text{km/h} [1]

6  From this list write down the irrational number.

\[ 5 \quad \sqrt{7} \quad \frac{2}{9} \quad \sqrt{9} \quad 7 \]

\[ \text{Answer} \] .......................................................... [1]
The diagram shows the graph of \( y = f(x) \).

Write down the equations of the two asymptotes of the graph.

\[ \text{Answer} \]

\[ \text{[2]} \]
The total cost of a holiday was $720.

The pie chart shows how this money was spent.

Find the amount of money spent on

(a) food,

Answer (a) $ ........................................... [2]

(b) other items.

Answer (b) $ ........................................... [2]
The diagram shows the graph of \( y = x^2 - 4x + 8 \) for \( 0 \leq x \leq 4 \).

Write down the equation of the line of symmetry of this graph.

\[ \text{Answer} \] [1]
11 **(a)** Simplify.

(i) \(3x - 5 + 2x - 12\)

\(\text{Answer(a)(i)}\) .......................................................... [2]

(ii) \(4 \times d \times 2 \times d\)

\(\text{Answer(a)(ii)}\) .......................................................... [1]

(iii) \(\frac{x}{3} - \frac{x}{6}\)

\(\text{Answer(a)(iii)}\) .......................................................... [2]

**(b)** Factorise completely.

\(6ab - 8a^2\)

\(\text{Answer(b)}\) .......................................................... [2]

**(c)** Solve the following equation.

\(x + 8 = 15\)

\(\text{Answer(c)} x = \) .......................................................... [1]

**(d)** Solve the inequality.

\(6x < 4x + 11\)

\(\text{Answer(d)}\) .......................................................... [2]
Data has been collected about the age (years) and the value (to the nearest $100) of the cars owned by a class of University students.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>1</th>
<th>2</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>4</th>
<th>5</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value ($)</td>
<td>8000</td>
<td>6400</td>
<td>5200</td>
<td>4000</td>
<td>3000</td>
<td>2100</td>
<td>1700</td>
<td>1200</td>
<td>800</td>
</tr>
</tbody>
</table>

(a) Complete the scatter diagram. The first five points have been plotted for you. [2]

(b) What type of correlation is shown on the scatter diagram?

\[ \text{Answer(b)} \] ................................................................. [1]

(c) The mean age is 4 years. The mean value is $3600.

Draw the line of best fit on your diagram. [2]
13 The base of this pyramid is a square of side 5 m.
   It has perpendicular height 12 m.

Work out the volume of the pyramid.

Answer ........................................... m\(^3\) [3]

14 A rectangle has sides 6 cm and 8 cm.

Work out the length of a diagonal of this rectangle.

Answer ........................................... cm [2]