



## 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  $h$ .  $V = \pi r^2 h$

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

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

Answer **all** the questions.

1 (a) Write 32 652

(i) correct to the nearest 10,

*Answer(a)(i)* ..... [1]

(ii) correct to the nearest 100.

*Answer(a)(ii)* ..... [1]

(b) Write 62.584 correct to 1 decimal place.

*Answer(b)* ..... [1]

(c) Calculate  $4.8^4$ .

*Answer(c)* ..... [1]

(d) Find  $\sqrt[3]{216}$ .

*Answer(d)* ..... [1]

(e) Find the highest common factor (HCF) of 18 and 45.

*Answer(e)* ..... [1]

(f) Find the lowest common multiple (LCM) of 6 and 8.

*Answer(f)* ..... [1]

(g) Divide 442 in the ratio 8 : 9.

*Answer(g)* ..... : ..... [2]

(h) Sem buys 7 hamburgers each costing \$1.20 .

Find how much change he receives from \$10.

*Answer(h)* \$ ..... [2]

- 2 (a) Write 0.75 as a fraction.

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

- (b) Write  $\frac{2}{3}$  as a percentage, giving your answer correct to 4 significant figures.

*Answer(b)* .....% [2]

- (c) Write 48% as a fraction in its lowest terms.

*Answer(c)* ..... [2]

- (d) Find 8% of 72.

*Answer(d)* ..... [1]

- (e) The price of a jacket is \$96.  
The price is reduced by 20%.

Find the new price of the jacket.

*Answer(e)* \$ ..... [2]

- (f) \$800 is invested for 5 years at 3% per year simple interest.

Find the total interest received at the end of the 5 years.

*Answer(f)* \$ ..... [2]

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- 3 A special die has 10 faces numbered 1 to 10.  
When the die is rolled it is equally likely to land on any face.

Find the probability that the die lands on

- (a) an even number,

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

- (b) a prime number,

*Answer(b)* ..... [1]

- (c) 11,

*Answer(c)* ..... [1]

- (d) a square number less than 5.

*Answer(d)* ..... [1]

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- 4 Jacinta asks some students in her class which colour they prefer. The results are in the table.

Colour	Number of students
Brown	1
Green	4
Black	8
Pink	12
Blue	15

- (a) Calculate the total number of students.

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

- (b) Write down the most popular colour.

*Answer(b)* ..... [1]

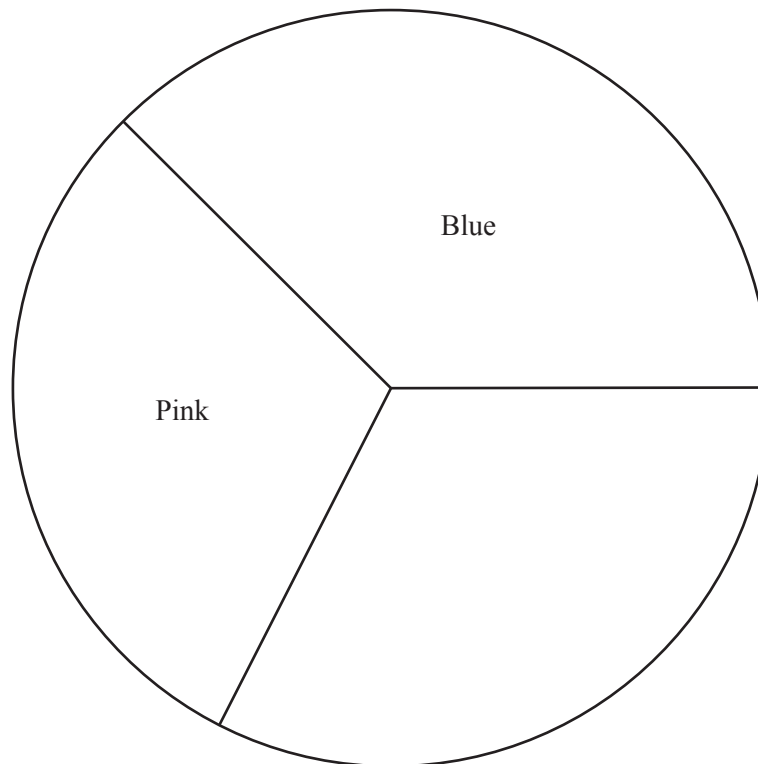
(c) Jacinta wants to draw a pie chart for these results.

Colour	Number of students	Sector angle in pie chart
Brown	1	
Green	4	
Black	8	
Pink	12	108°
Blue	15	135°

(i) Complete the table.

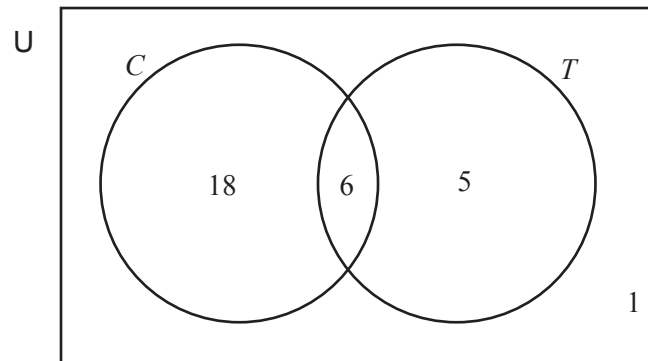
[2]

(ii) Complete the pie chart to show this information.  
Two sectors have been drawn for you.



[2]

- 5 HanRa asked 30 students if they ate cereal ( $C$ ) or toast ( $T$ ) for breakfast. The information is shown in the Venn diagram.



Write down the number of students in

- (a)  $C \cap T$ ,

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

- (b)  $C$ ,

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

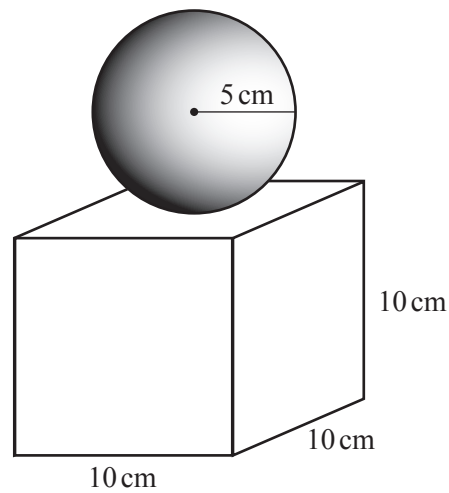
- (c)  $(C \cup T)'$ ,

Answer(c) ..... [1]

- (d)  $T \cup C'$ .

Answer(d) ..... [1]



NOT TO  
SCALE

A trophy is in the shape of a cube of side 10 cm with a sphere of radius 5 cm on top.

- (a) Find the surface area of the cube.

*Answer(a)* .....  $\text{cm}^2$  [2]

- (b) Find the surface area of the sphere.

*Answer(b)* .....  $\text{cm}^2$  [2]

- (c) Find the total **volume** of the trophy.

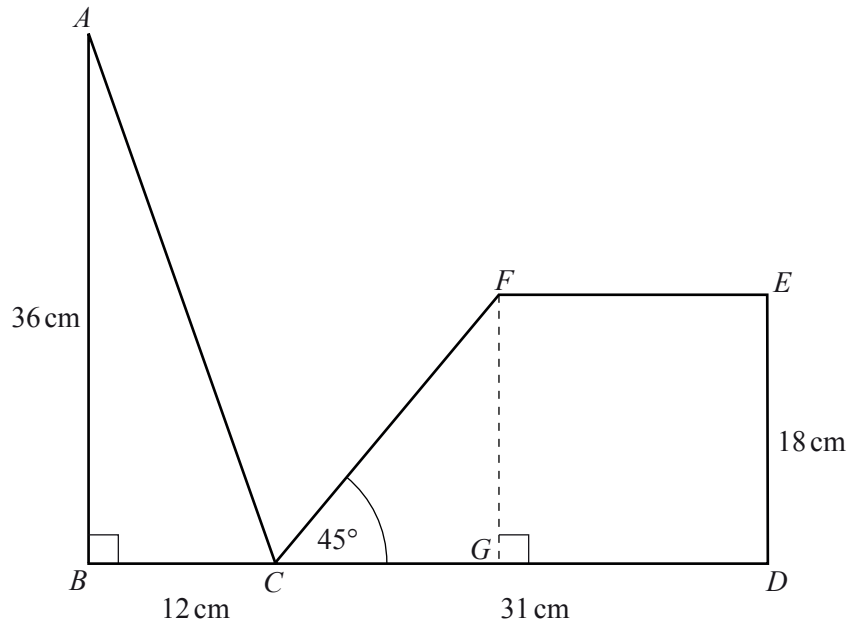
*Answer(c)* .....  $\text{cm}^3$  [4]

The trophy is made from metal that costs 4 cents per  $\text{cm}^3$ .

- (d) Find the cost of the metal used to make the trophy.  
Give your answer in dollars.

*Answer(d)* \$ ..... [2]

7

NOT TO  
SCALE

The diagram shows a triangle  $ABC$  and a trapezium  $CDEF$ .  
 $BCGD$  is a straight line and angle  $FCD = 45^\circ$ .

$AB = 36$  cm,  $BC = 12$  cm,  $CD = 31$  cm and  $ED = 18$  cm.

(a) Find the size of angle  $CFE$ .

Answer(a) Angle  $CFE = \dots\dots\dots$  [1]

(b) Use trigonometry to calculate the size of angle  $BCA$ .

Answer(b) Angle  $BCA = \dots\dots\dots$  [2]

(c) Use Pythagoras' Theorem to find the length of  $AC$ .

Answer(c)  $AC = \dots\dots\dots$  cm [2]

(d) Use trigonometry to calculate the length of  $CF$ .

*Answer(d)*  $CF = \dots\dots\dots$  cm [3]

(e) (i) Explain why  $EF = 13$  cm.

[2]

(ii) Find the total perimeter of the shape.

*Answer(e)(ii)*  $\dots\dots\dots$  cm [1]

(f) Calculate the total area of the shape.

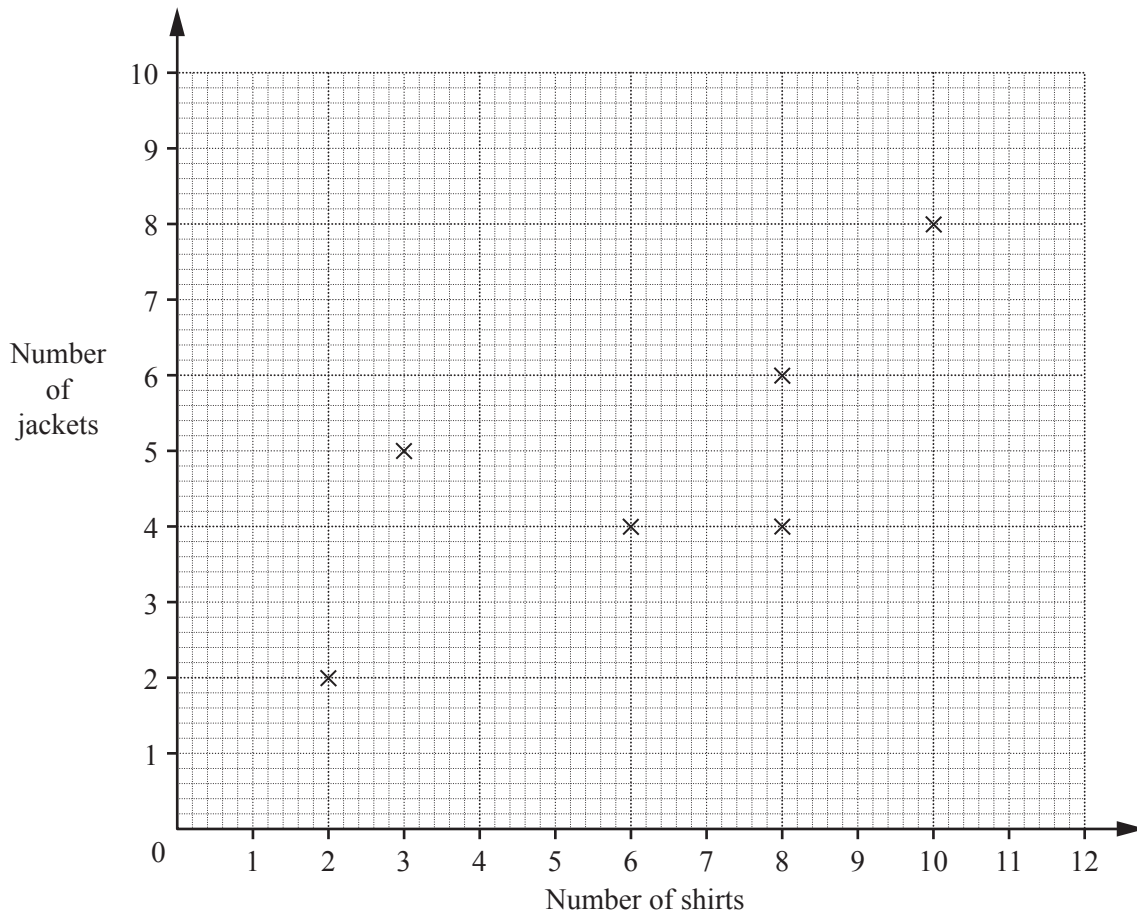
*Answer(f)*  $\dots\dots\dots$  cm<sup>2</sup> [3]

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- 8 The table shows the number of shirts and the number of jackets owned by 12 students.

Shirts	3	6	2	8	8	10	6	5	9	8	4	12
Jackets	5	4	2	4	6	8	5	4	6	5	4	7

- (a) Complete the scatter diagram.  
The first 6 points have been plotted for you.



- (b) Write down the type of correlation shown by the scatter diagram.

*Answer(b)* ..... [1]

- (c) (i) Find the mean number of shirts.

*Answer(c)(i)* ..... [1]

- (ii) Find the mean number of jackets.

*Answer(c)(ii)* ..... [1]

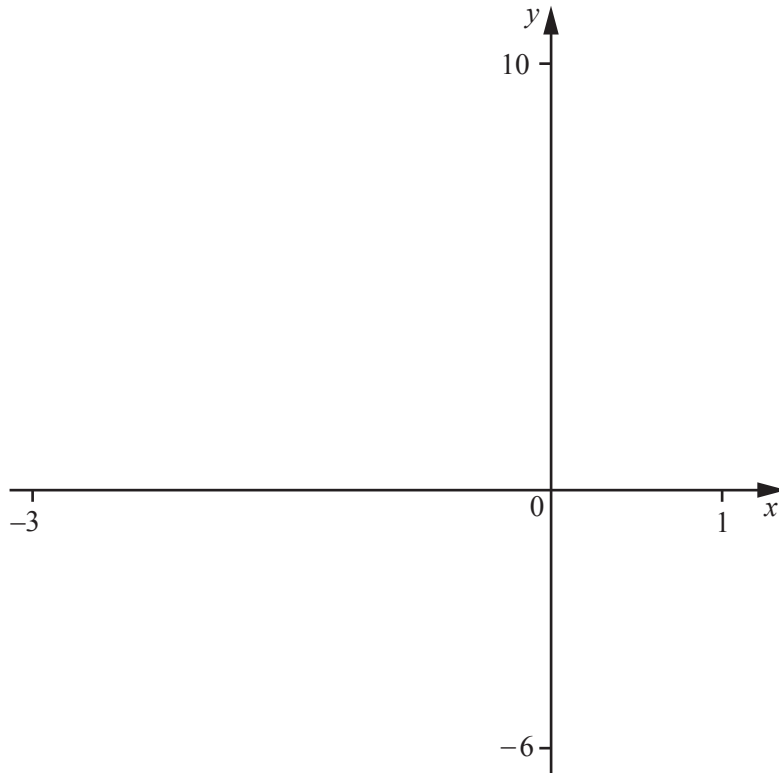
- (iii) On the diagram, plot the mean point.

[1]

- (d) On the diagram, draw a line of best fit by eye. [2]
- (e) Use your line of best fit to estimate the number of jackets for a student who has 7 shirts.

*Answer(e)* ..... [1]

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$$f(x) = 6 - 5x - 3x^2$$

(a) On the diagram, sketch the graph of  $y = f(x)$  for  $-3 \leq x \leq 1$ . [2]

(b) Write down the  $y$  co-ordinate of the point where the graph crosses the  $y$ -axis.

Answer(b)  $y = \dots\dots\dots$  [1]

(c) Write down the  $x$  co-ordinates of the points where the graph crosses the  $x$ -axis.

Answer(c)  $x = \dots\dots\dots$  and  $x = \dots\dots\dots$  [2]

(d) Find the co-ordinates of the local maximum point.

Answer(d) (  $\dots\dots\dots$  ,  $\dots\dots\dots$  ) [1]

(e)  $g(x) = 2x + 4$

On the same diagram, sketch the graph of  $y = g(x)$ . [2]

(f) Find the co-ordinates of the points of intersection of  $f(x)$  and  $g(x)$ .

Answer(f) (  $\dots\dots\dots$  ,  $\dots\dots\dots$  ) and (  $\dots\dots\dots$  ,  $\dots\dots\dots$  ) [2]

10 (a) Solve.

(i)  $5x + 6 = -4$

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

(ii)  $6x + 3 < 21$

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

(b) Simplify.

(i)  $s^3 \times s^4$

Answer(b)(i) ..... [1]

(ii)  $(t^2)^4$

Answer(b)(ii) ..... [1]

(iii)  $18r^3 \div 3r$

Answer(b)(iii) ..... [2]

(c) Expand and simplify.

$$4(x - 3) + 3(2x + 1)$$

Answer(c) ..... [2]

(d) Factorise completely.

$$15y - 3y^2$$

Answer(d) ..... [2]

Question 11 is printed on the next page.

- 11 (a) Ahmed cycles 15 kilometres in 50 minutes.

Find his average speed in kilometres per hour.

*Answer(a)* ..... km/h [3]

- (b) George runs 15 kilometres at an average speed of 12 kilometres per hour.

Find how many minutes it takes George to run the 15 kilometres.

*Answer(b)* ..... min [3]

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