

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 .

$$A = 2\pi r h$$

Curved surface area, A , of cone of radius r , sloping edge l .

$$A = \pi r l$$

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) Here is a list of numbers.

8 10 14 17 20 25

From this list, write down

- (i) an odd number,

..... [1]

- (ii) a multiple of 7,

..... [1]

- (iii) a square number.

..... [1]

- (b) Here are the first four numbers in a sequence.

8 11 14 17

Write down the next two terms in this sequence.

....., [2]

- (c) Write 3658 correct to the nearest 100.

..... [1]

- (d) Write 68.437

- (i) correct to 2 decimal places,

..... [1]

- (ii) correct to 3 significant figures.

..... [1]

- (e) $s = 2m + 3n$

Find the value of s when $m = 4.8$ and $n = 1.6$.

$s =$ [2]

- (f) Change 2.3 kilometres into metres.

..... m [1]

2 A school shop sells the following.

	Cost (cents)
Pencil	12
Sharpener	25
Eraser	10
Ruler	30

(a) Gigue buys 3 pencils and 1 sharpener.

Work out how much he spends.

..... cents [2]

(b) The cost of a ruler is increased by 20%.

Work out the new cost of a ruler.

..... cents [2]

(c) In a sale, the cost of a sharpener is reduced to 19 cents.

Work out the percentage reduction.

.....% [2]

- 3 Some students were asked to choose their favourite colour of candy.

All their choices are shown in the table.

Favourite colour	Red	Blue	Yellow	Green	Orange
Number of students	6	5	2	2	3

- (a) Find the number of students that were asked.

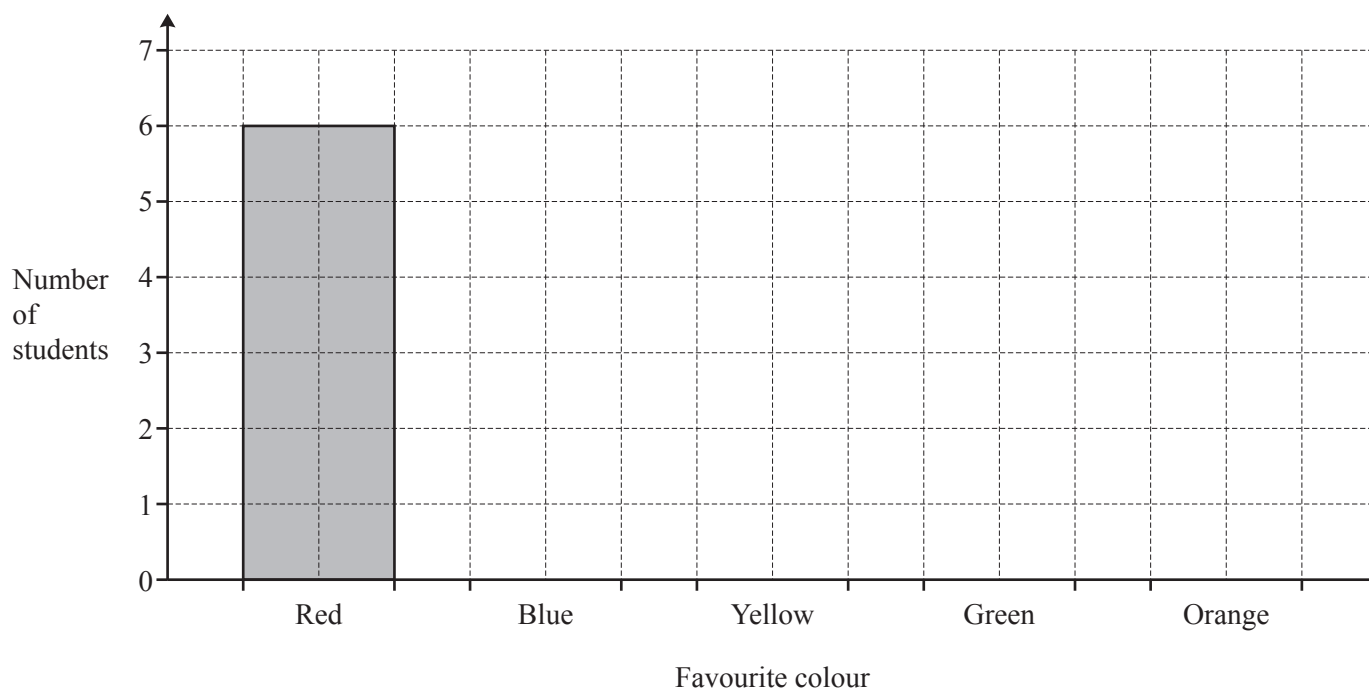
..... [1]

- (b) One of these students is chosen at random.

Find the probability that their favourite colour of candy is blue.

..... [1]

- (c) Complete the bar chart.



[2]

- 4 There are 36 cars altogether in a car park.
There are 11 black cars, 10 red cars and the rest of the cars are blue.

(a) Work out the number of blue cars.

..... [1]

(b) Write down the fraction of cars in the car park that are black.

..... [1]

(c) The information is to be shown in a pie chart.

Work out the sector angle for red cars.

..... [2]

5 (a)

VRIEND

From the letters above, write down **all** the letters that have

(i) line symmetry,

..... [2]

(ii) rotational symmetry,

..... [2]

(iii) both line symmetry and rotational symmetry,

..... [1]

(iv) neither line symmetry nor rotational symmetry.

..... [1]

(b) On a poster, the letter **I** is a rectangle of width 2 cm and height 11 cm.

(i) Work out the perimeter of the letter **I**.

..... cm [1]

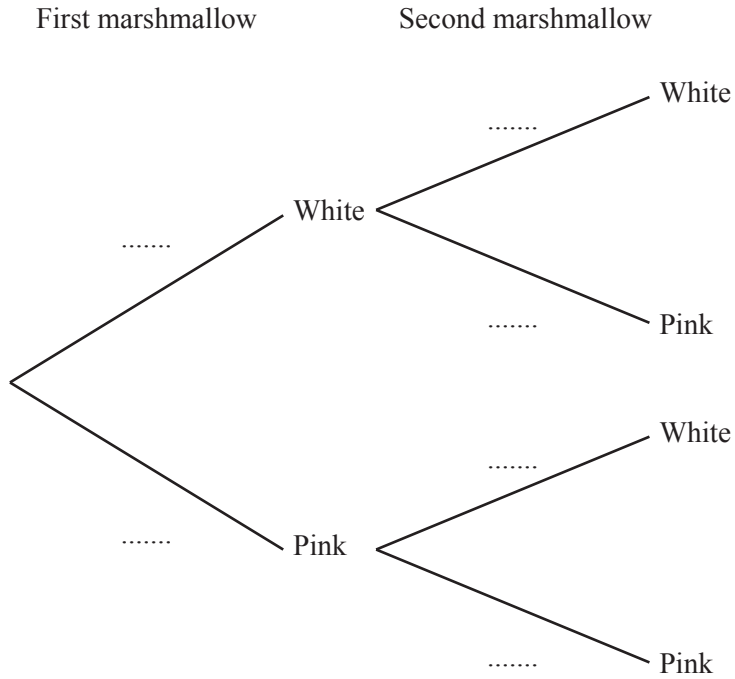
(ii) Work out the area of the letter **I**.

..... cm² [1]

6 A bag contains 15 marshmallows. 8 of these are white and 7 are pink.

Terry picks a marshmallow at random from the bag and eats it.
He then picks a second marshmallow at random from the bag and eats it.

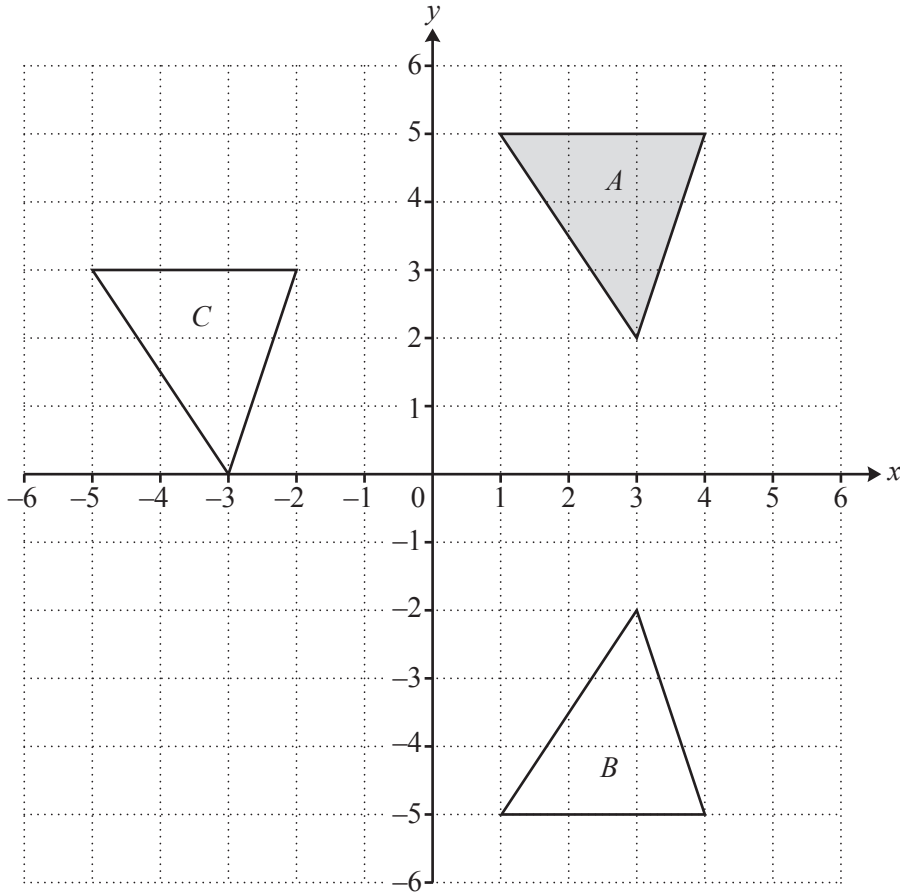
(a) Complete the probability tree diagram.



[3]

(b) Find the probability that both marshmallows were white.

..... [2]



(a) Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

.....
 [2]

(b) Describe fully the **single** transformation that maps triangle *A* onto triangle *C*.

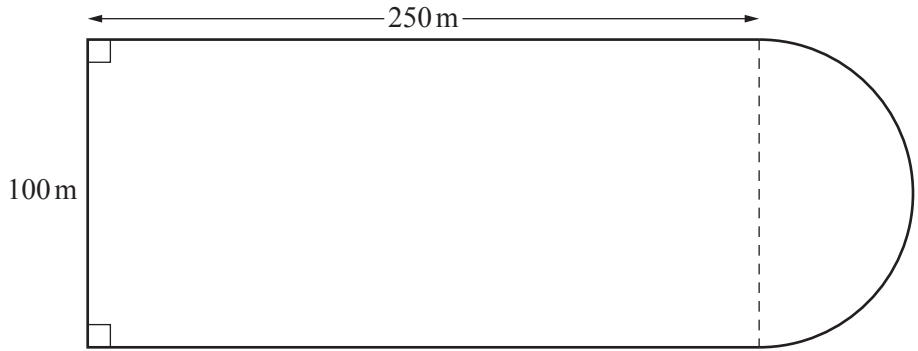
.....
 [2]

(c) On the grid, draw the image of triangle *A* after a rotation of 180° about the origin. Label this image *D*. [2]

(d) Describe fully the **single** transformation that maps triangle *C* onto triangle *D*.

.....
 [2]

8



NOT TO SCALE

The diagram shows a rectangle joined to a semicircle.
There is a path along the perimeter of this shape.

- (a) Show that the length of the path is 757 m, correct to the nearest metre.

[3]

- (b) Maggie runs around the path at a speed of 220 metres per minute.

Work out how long it takes Maggie to run around the path.
Give your answer in minutes.

..... min [1]

- (c) Jack takes 10 minutes to walk around the path.

Work out his average speed in km/h.

..... km/h [3]

- (d) Work out the **total** area enclosed by the path.

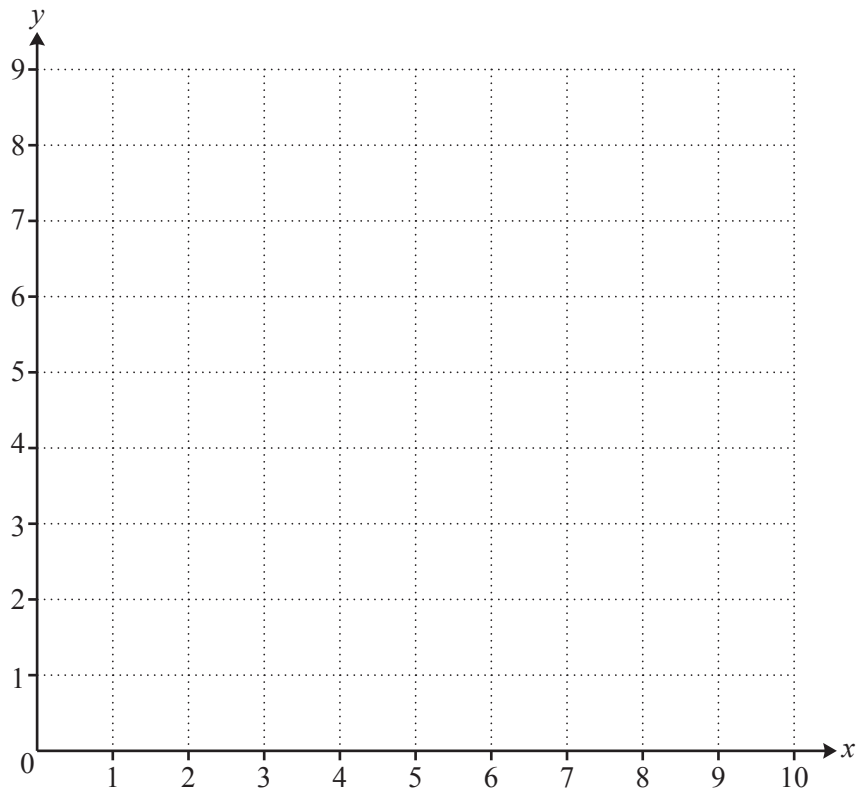
.....m² [3]

- (e) The area inside the path is covered with grass.
Grass cost \$0.29 for one square metre.

Work out the **total** cost for the grass.

\$..... [1]

9 The diagram shows a 1cm^2 grid.



(a) On the grid, plot the points $R(2, 2)$, $S(8, 2)$ and $T(8, 8)$.
Join these points to form a right-angled triangle. [2]

(b) Find

(i) the length of RS ,

..... cm [1]

(ii) the area of the triangle,

..... cm^2 [1]

(iii) the gradient of RT .

..... [2]

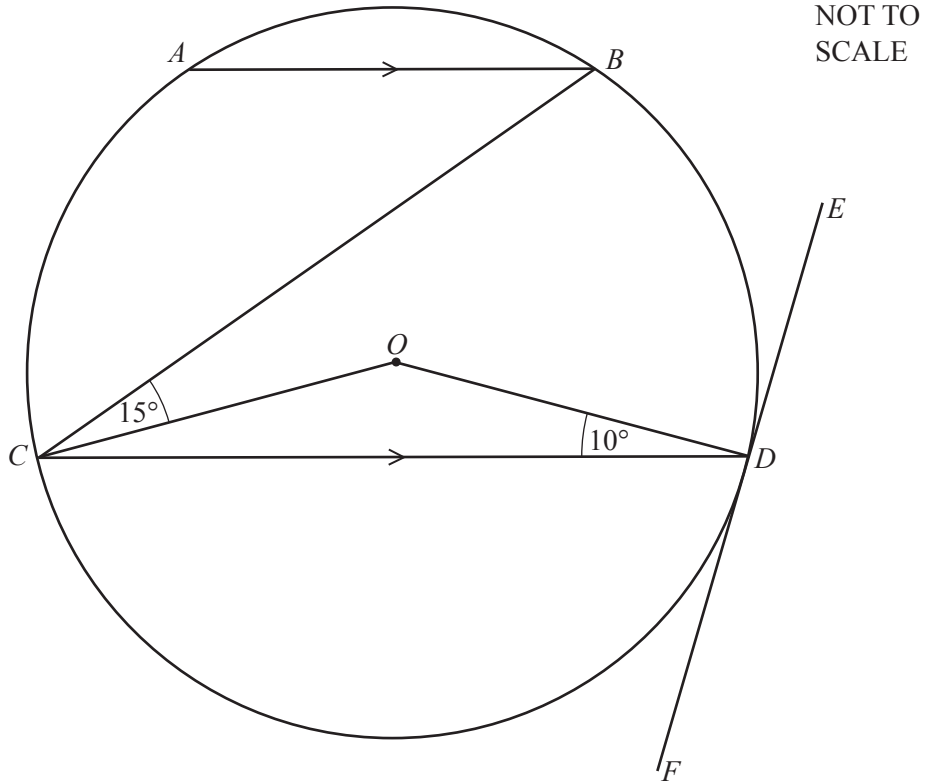
(c) Find the co-ordinates of the midpoint of RT .

(.....,) [1]

(d) Write down the equation of the line ST .

..... [1]

10 (a)



The diagram shows a circle, centre O .
 AB and CD are parallel chords and the line EDF is a tangent to the circle at D .
 Angle $ODC = 10^\circ$ and angle $OCB = 15^\circ$.

Find the size of

(i) angle ODE ,

Angle $ODE = \dots\dots\dots [1]$

(ii) angle CDF ,

Angle $CDF = \dots\dots\dots [1]$

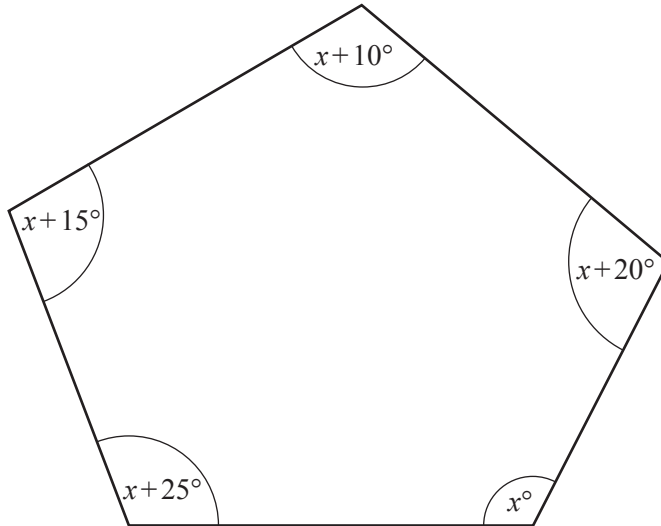
(iii) angle COD ,

Angle $COD = \dots\dots\dots [2]$

(iv) angle CBA .

Angle $CBA = \dots\dots\dots [1]$

(b)

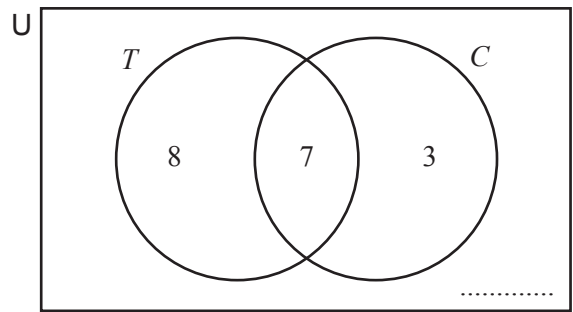
NOT TO
SCALE

The diagram shows a pentagon.

Find the value of x .

$x = \dots\dots\dots$ [3]

11 The Venn diagram shows the number of students in a class wearing a T-shirt, T , or a cardigan, C .



(a) There are 20 students in total in the class.

Complete the Venn diagram. [1]

(b) Find the probability that one of these students, chosen at random, wears

(i) both a T-shirt and a cardigan, [1]

(ii) a T-shirt but not a cardigan. [1]

(c) Find $n(T)$ [1]

(d) On the Venn diagram, shade $C \cap T'$. [1]

12 (a) $T = 5R - S$

Find the value of T when $R = 3$ and $S = 4$.

$T =$ [2]

(b) Simplify fully.

(i) $3a - 6b + 2a - b$ [2]

(ii) $\frac{10x}{5x}$ [1]

(c) Solve.

(i) $\frac{x}{2} = 5$

$x = \dots\dots\dots$ [1]

(ii) $7x + 2 = 51$

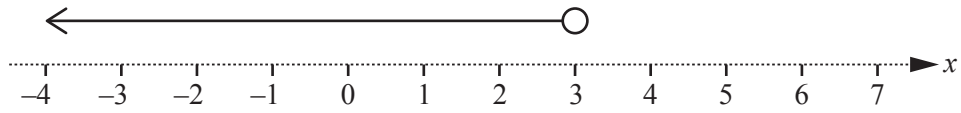
$x = \dots\dots\dots$ [2]

(d) Expand the brackets and simplify.

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

$\dots\dots\dots$ [2]

(e) Write down the inequality shown by this number line.



$\dots\dots\dots$ [1]

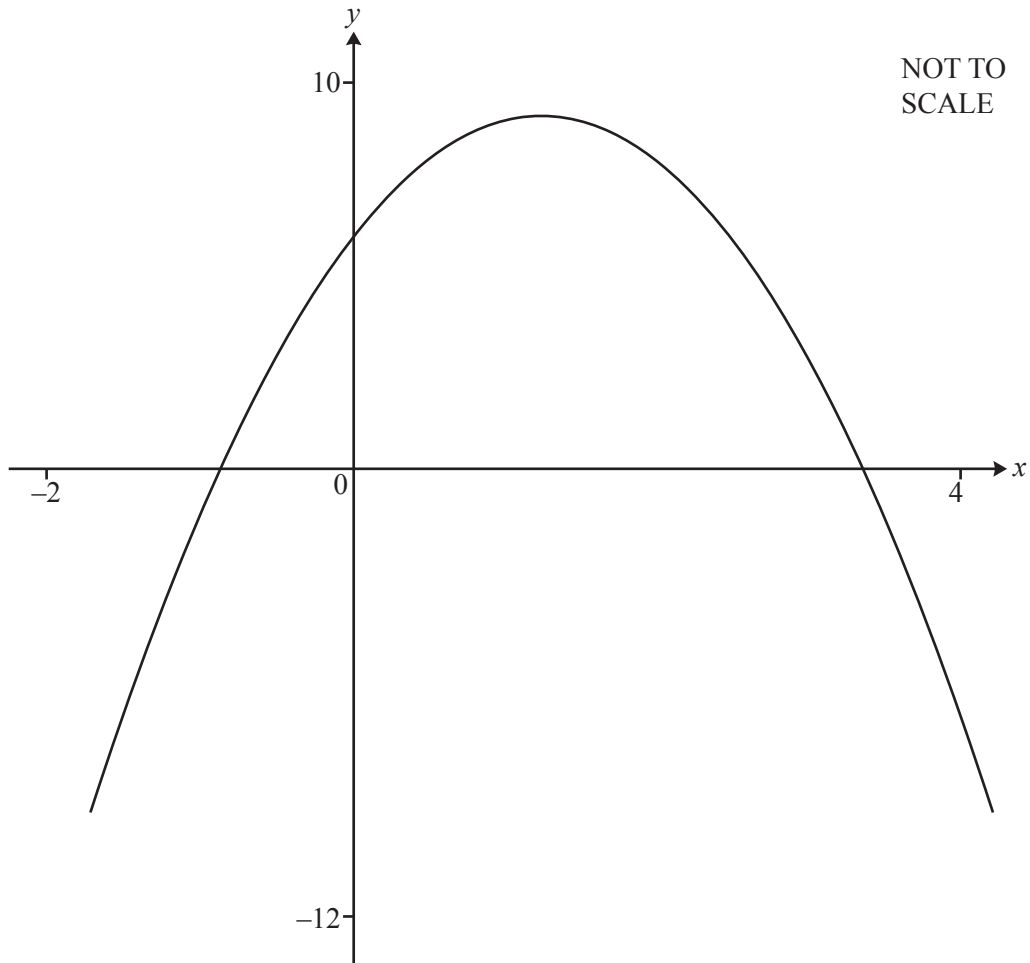
(f) Solve these simultaneous equations.
You must show all your working.

$2x - y = 9$
 $3x + y = 16$

$x = \dots\dots\dots$

$y = \dots\dots\dots$ [2]

Question 13 is printed on the next page.



The diagram shows the graph of $y = f(x)$ where $f(x) = -2x^2 + 5x + 6$ for $-2 \leq x \leq 4$.

(a) Use your calculator to find the zeros of $f(x)$.

..... and [2]

(b) Use your calculator to find the co-ordinates of the local maximum.

(.....,) [2]

(c) Write down the equation of the line of symmetry.

..... [1]

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