1 **(a)** Show that this is a formula for the total surface area, A, of a cube of edge length x.

$$A = 6x^2$$

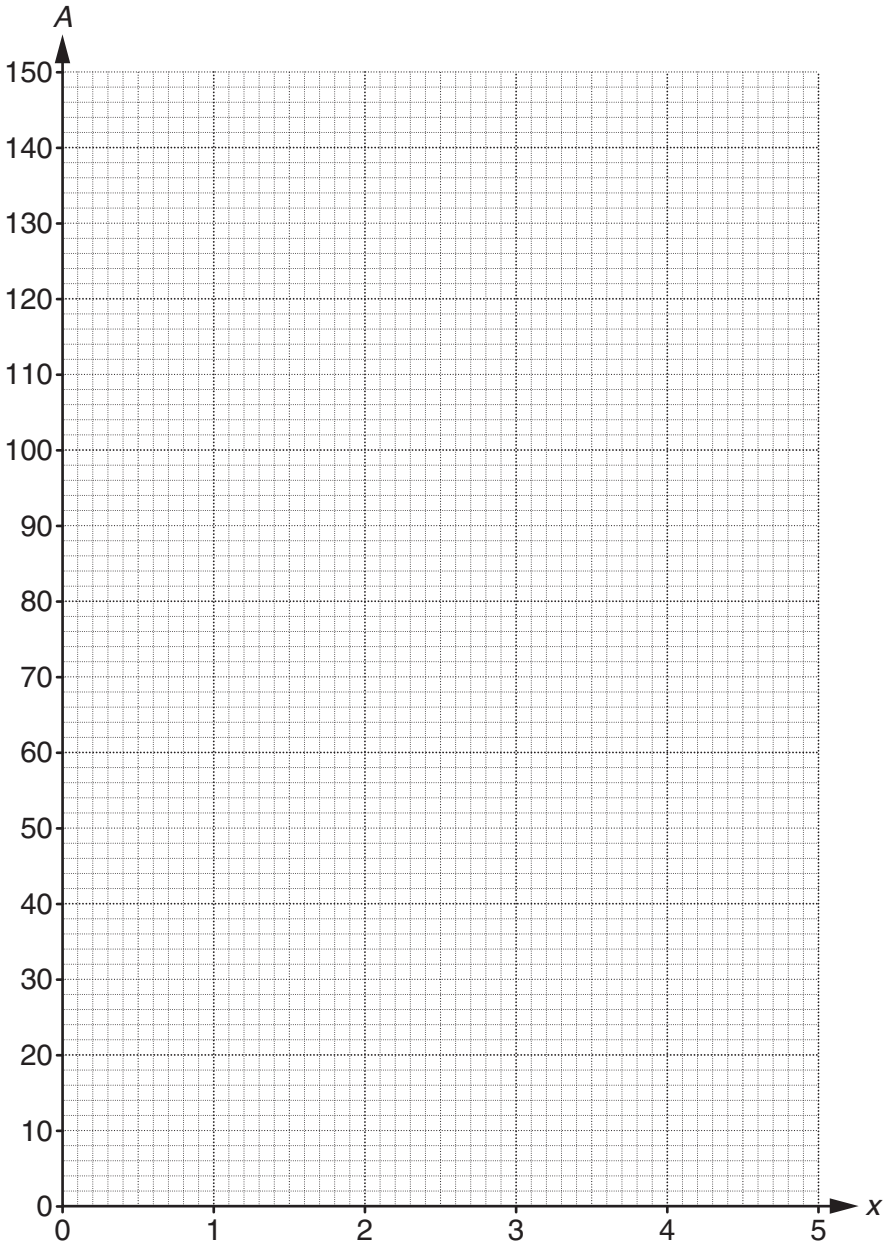
Explain clearly each step of your work. **[2]**

(b) Complete the table for $A = 6x^2$ for $0 \leqslant x \leqslant 5$.

x	0	1	2	3	4	5
A	0					

[2]

(c) Draw the graph of $A = 6x^2$ for $0 \leqslant x \leqslant 5$.



[2]

(d) Use your graph to find the length of the edge of a cube which has a total surface area of $70\,\text{cm}^2$.

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

2 A ball is kicked into the air.
The height, h metres, of the ball above the ground after t seconds is given by this formula.

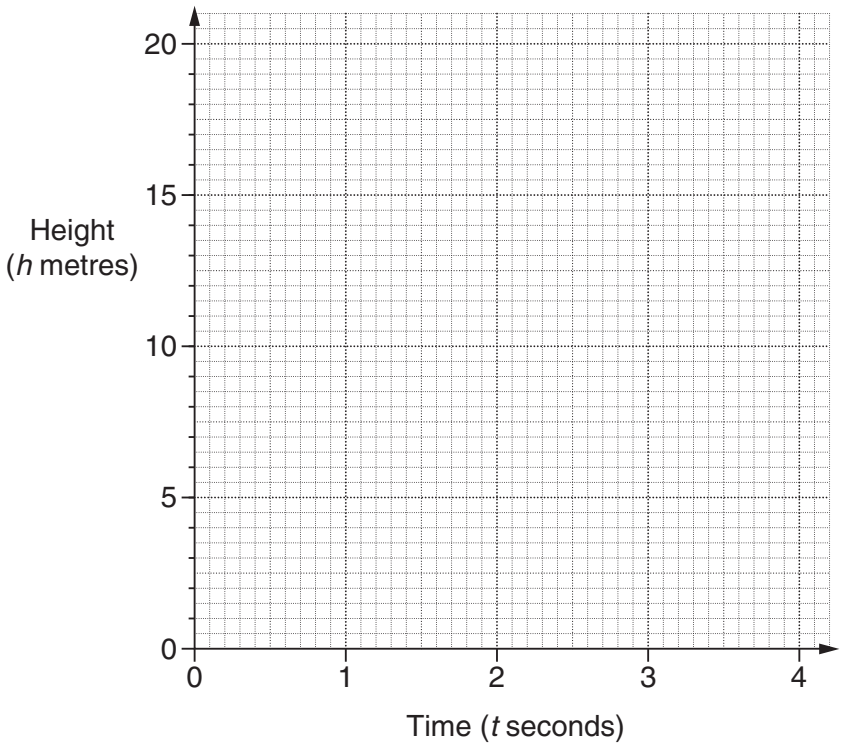
$$h = 17t - 5t^2$$

(a) Complete the table of values.

t	0	0.5	1	2	2.5	3
h	0	7.25		14		6

[2]

(b) Draw the graph of $h = 17t - 5t^2$.



[2]

(c) Use your graph to estimate the maximum height of the ball.

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

(d) Use your graph to estimate the time when the ball hits the ground.

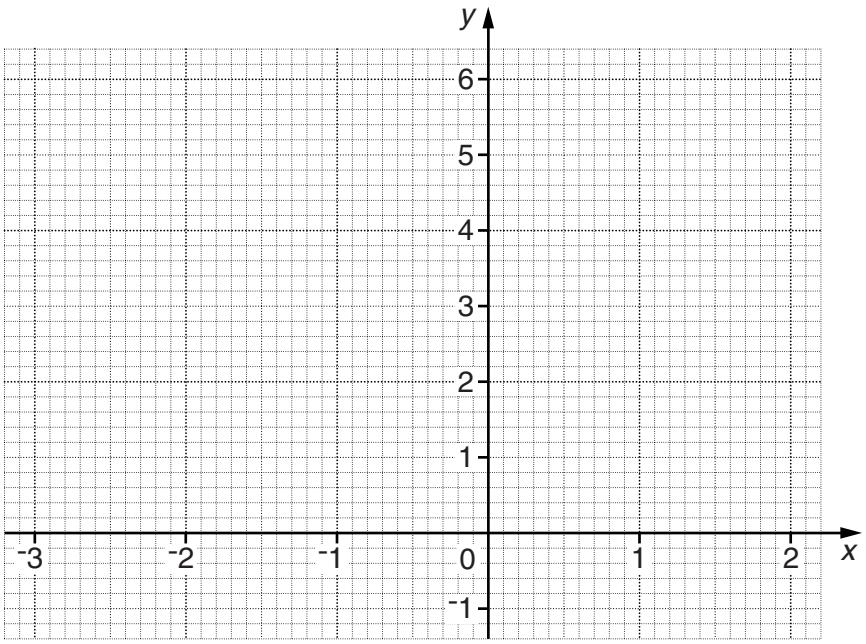
(d) ..... seconds **[1]**

3 **(a)** Complete the table for $y = x^2 + x$.

x	$^-3$	$^-2$	$^-1$	0	1	2
y	6			0	2	

[2]

(b) Draw the graph of $y = x^2 + x$ for $^-3 \leqslant x \leqslant 2$.



[3]

(c) Use your graph to solve $x^2 + x = 3$.
Give your answers correct to 1 decimal place.

(c) _____ **[2]**

(d) Use your graph to solve these simultaneous equations.

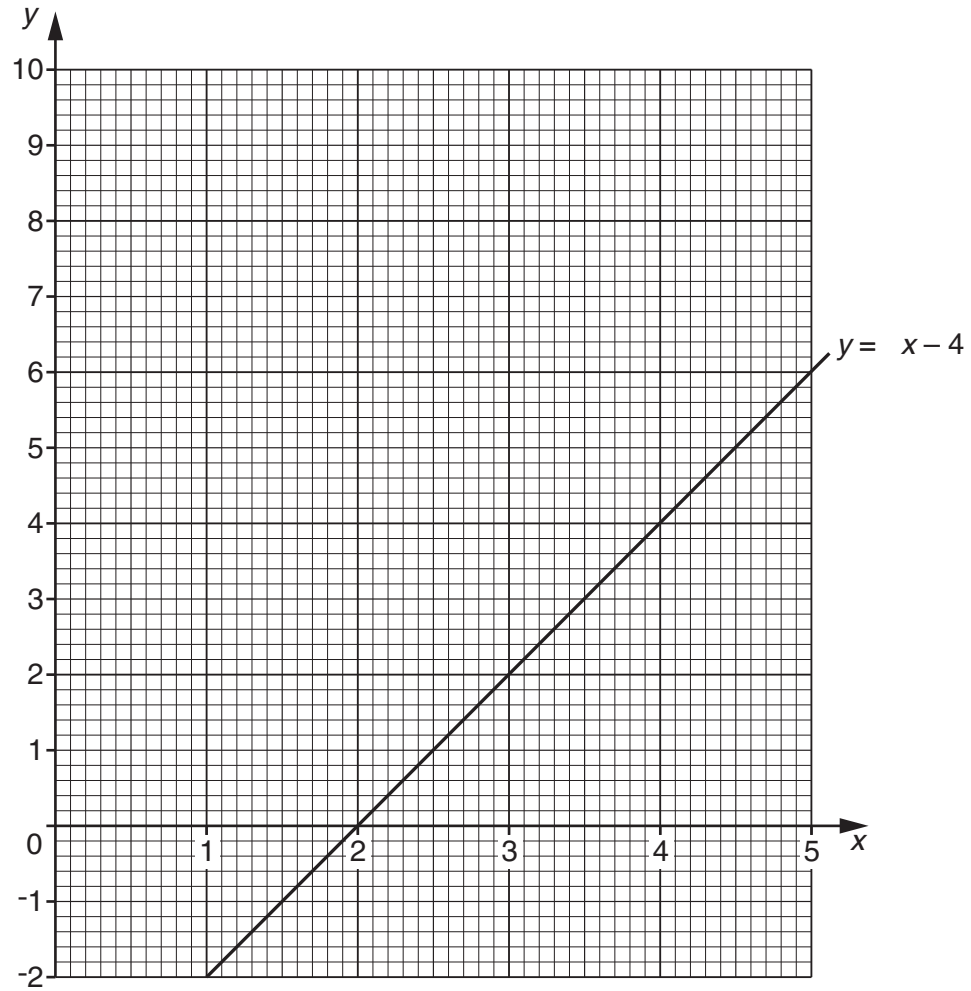
$$y = x^2 + x$$
$$y = x + 2$$

Give your answers correct to 1 decimal place.

(d) $x =$ _____ $y =$ _____

$x =$ _____ $y =$ _____ **[3]**

4 The grid shows the graph of $y = 2x - 4$.



(a) Complete the table for $y = x^2 - 4x + 3$.

x	0	1	2	3	4	5
y	3	0		0	3	

[2]

(b) On the grid, draw the graph of $y = x^2 - 4x + 3$ for $0 \leqslant x \leqslant 5$. **[2]**

(c) Use your graphs to solve these simultaneous equations.

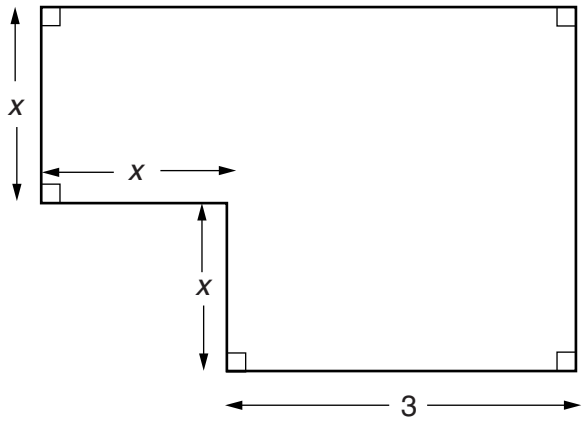
$y = 2x - 4$

$y = x^2 - 4x + 3$

(c) x = ... y = ...

x = ... y = ... **[2]**

5 The diagram shows the plan of a room.
All lengths are in metres.



Not to scale

(a) Show that the total area of the room, $A\text{m}^2$, can be given by this formula.

$$A = x^2 + 6x$$

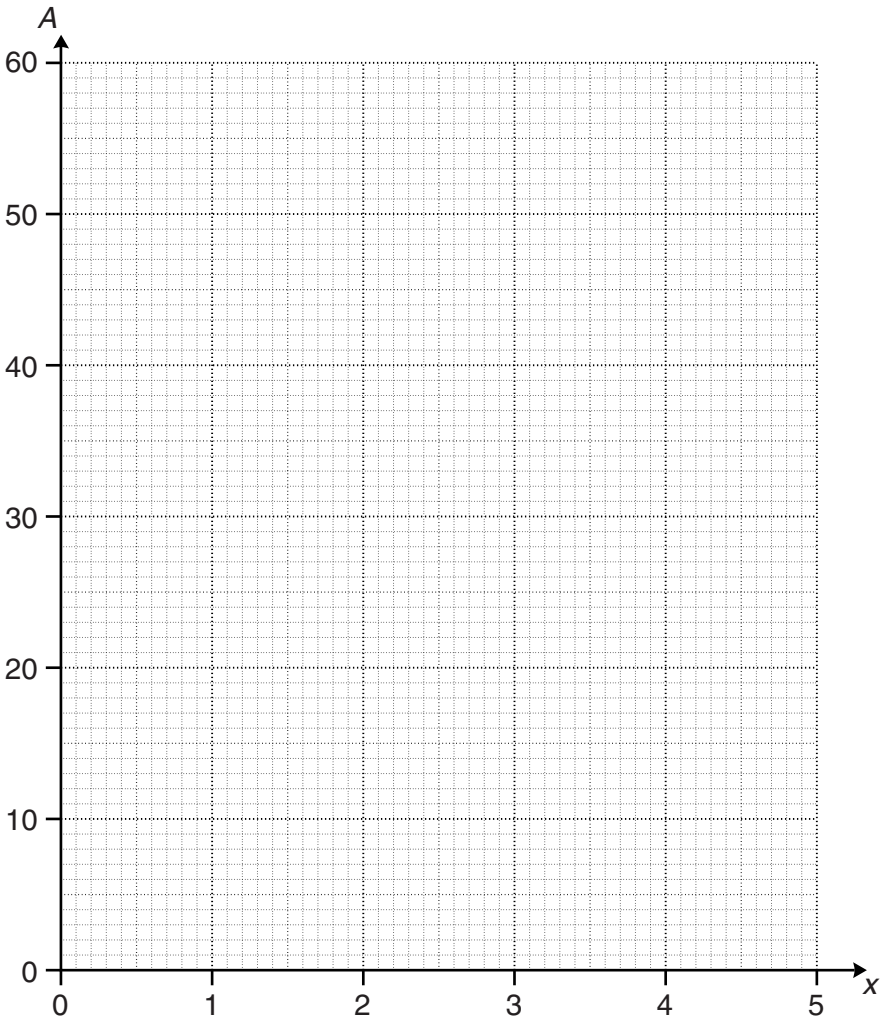
[2]

(b) Complete the table for $A = x^2 + 6x$.

x	0	1				
A	0		16	27	40	

[2]

(c) Draw the graph of $A = x^2 + 6x$ for x from 0 to 5.



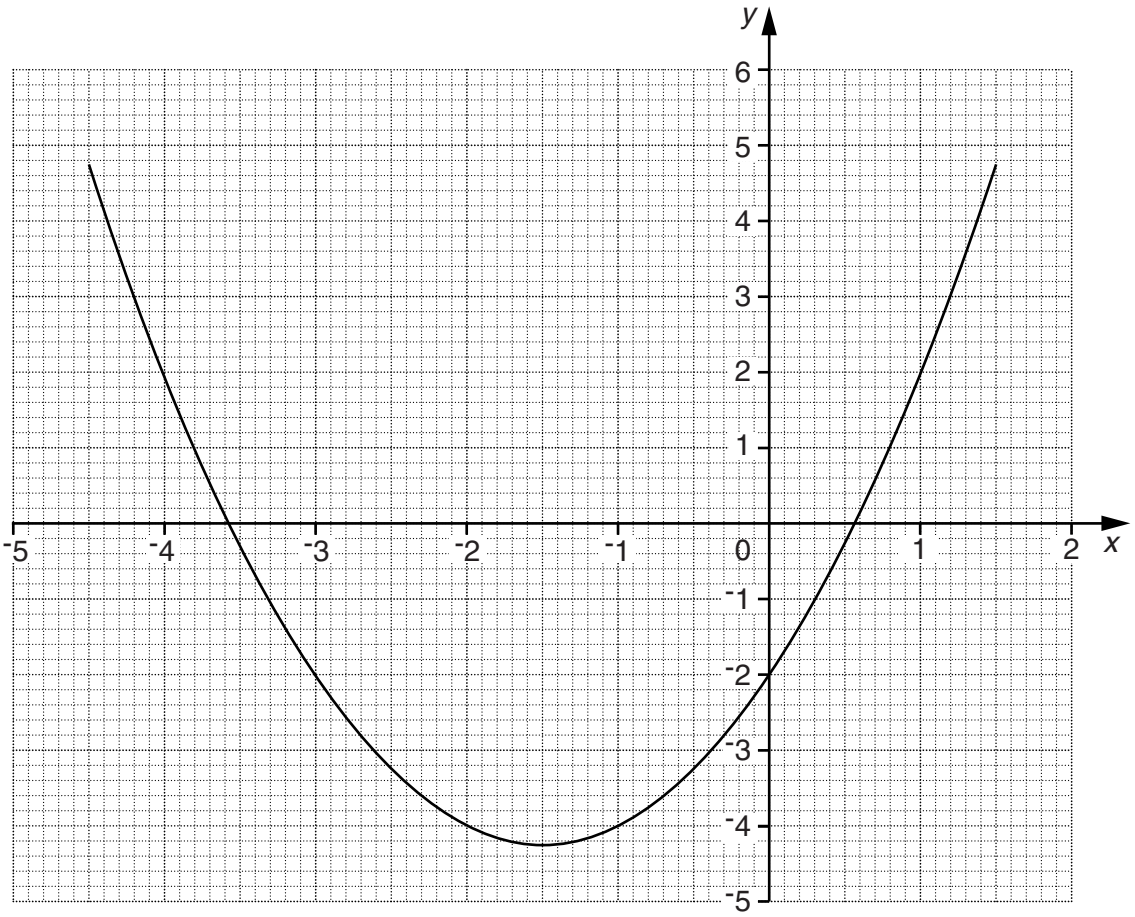
[2]

(d) The total area of the room is $35\,m^2$.

Use your graph to find the length x.

(d) _____ m **[1]**

6 Here is the graph of $y = x^2 + 3x - 2$.



(a) Use the graph to solve this equation.

$$x^2 + 3x - 2 = 0$$

(a) _____ **[2]**

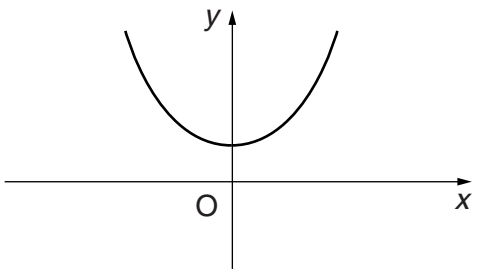
(b) By drawing a suitable straight line on the grid, solve this equation.

$$x^2 + 3x - 2 = x + 2$$

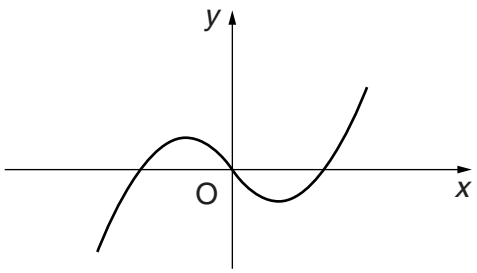
(b) _____ **[3]**

7 Match one of these equations to each of the sketch graphs below.

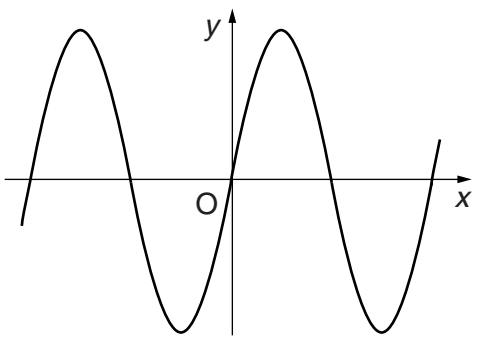
$y = x^2$	$y = \sin x$	$y = x^3$
$y = x^3 - 2x$	$y = x^2 + 4$	$y = \cos x$



Equation _____



Equation _____



Equation _____

[3]