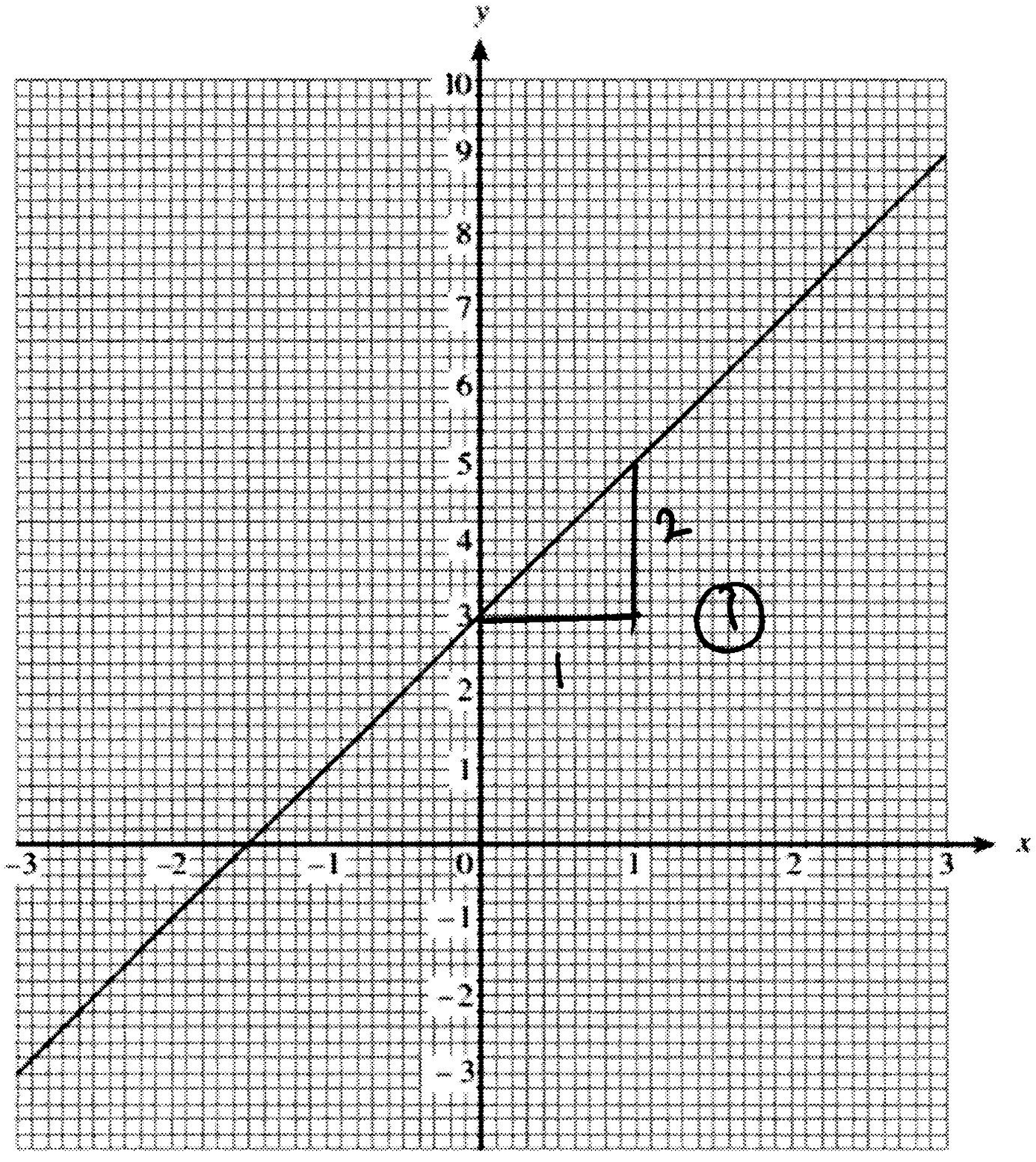
ANSWERS

Algebraic Graphs – Past Paper Questions

11. The diagram shows a straight line graph.



(a) Find the gradient of the straight line.

Gradient $= \frac{2}{1} = 2$ (1)

[2]

(b) Write down the equation of the straight line in the form $y = mx + c$.

$y = 2x + 3$ (1)

[1]

10. The table shows values of $y = 2x^2 - 5x - 7$ for values of x from -2 to 4.

x	-2	-1	0	1	2	3	4
$y = 2x^2 - 5x - 7$	11	0	-7	-10	-9	-4	5

(a) **Complete the table above.**

(1)

[1]

(b) **On the graph paper below draw the graph of $y = 2x^2 - 5x - 7$ for the values of x from -2 to 4.**

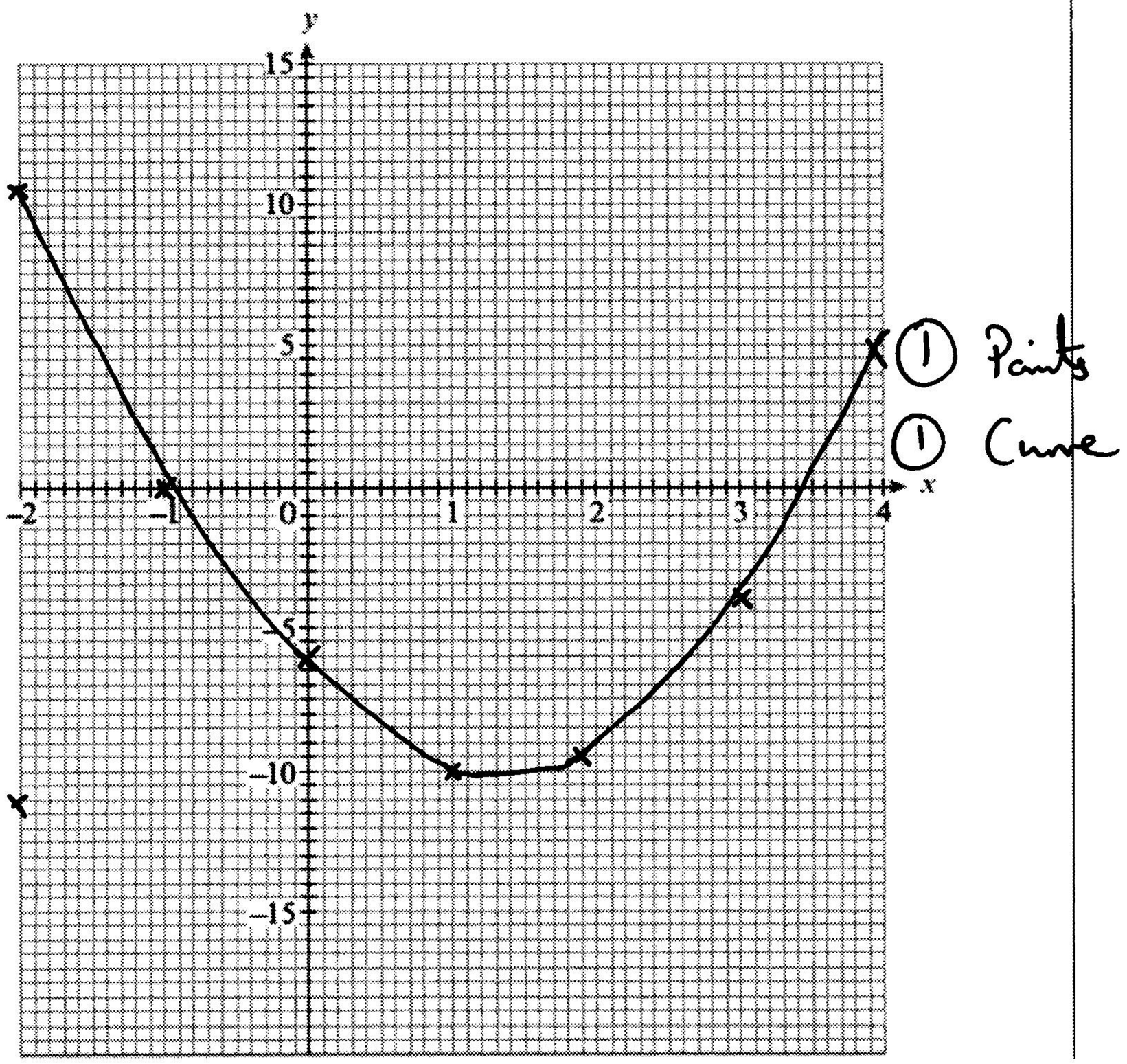
[2]

(c) **Write down the x-coordinates of the points where the curve $y = 2x^2 - 5x - 7$ intersects the x-axis.**

$x = -1$

$x = 3.4$ (1)

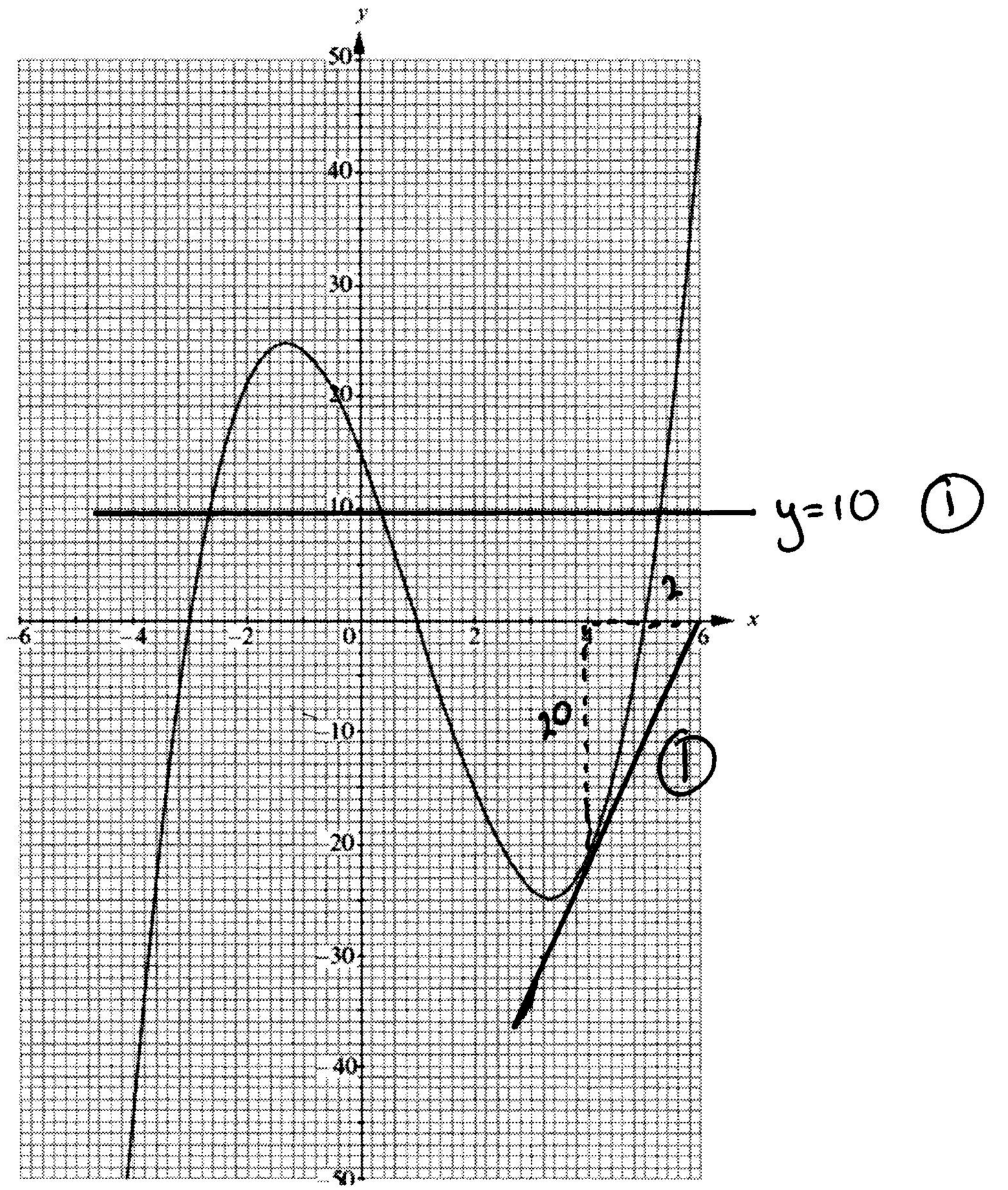
[1]



(1) Points

(1) Curve

14. The graph of $y = x^3 - 3x^2 - 13x + 15$, for values of x between $x = -4$ and $x = 6$, has been drawn below.



(a) Use the graph to solve $x^3 - 3x^2 - 13x + 15 = 0$.

cuts a x-axis.

$x = -3, 1, 5$ (1)

[1]

(b) Using the graph, estimate the gradient of the curve $y = x^3 - 3x^2 - 13x + 15$ when $x = 4$.

Gradient $= \frac{20}{2}$ (1) $= 10$ (1)

[3]

(c) By drawing an appropriate line on the graph, solve the equation

$$x^3 - 3x^2 - 13x + 5 = 0.$$

$x^3 - 3x^2 - 13x + 5 = 0$

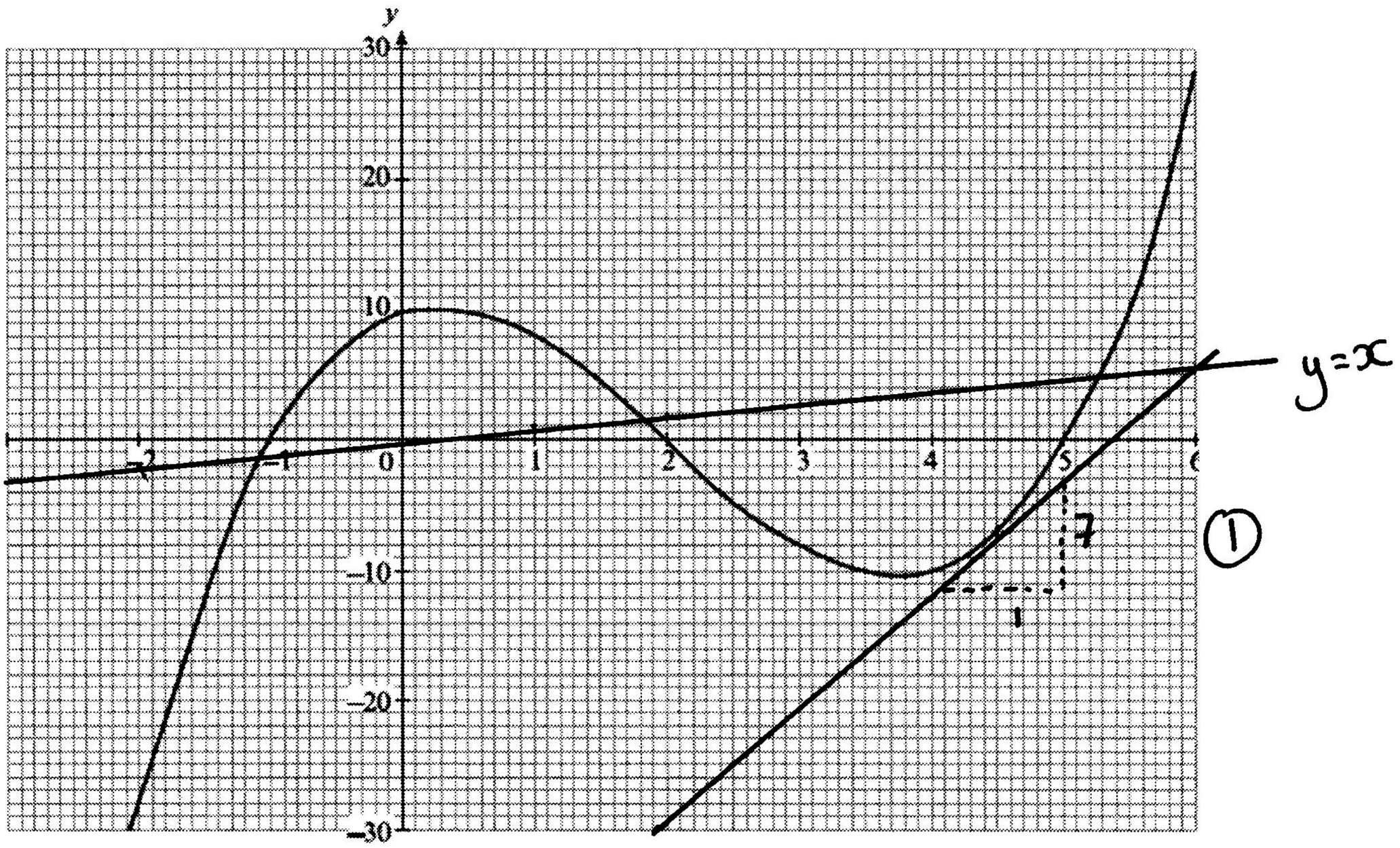
$x^3 - 3x^2 - 13x + 15 = 10$

So $x = -2.8, 0.4, 5.2$

[3]

(2) Can be close...

14. The graph of $y = x^3 - 6x^2 + 3x + 10$, for values of x between $x = -2$ and $x = 6$, is drawn below.



① ① ①

(a) Use the graph to solve $x^3 - 6x^2 + 3x + 10 = 0$.

$x = -1, 2, 5$ ①

[1]

(b) Using the graph, estimate the gradient of the curve $y = x^3 - 6x^2 + 3x + 10$ when $x = 4{\cdot}5$.

Gradient $= \frac{7}{1} = 7$

① ① ①

[3]

(c) By drawing an appropriate straight line on the graph, solve the equation

$$x^3 - 6x^2 + 2x + 10 = 0$$

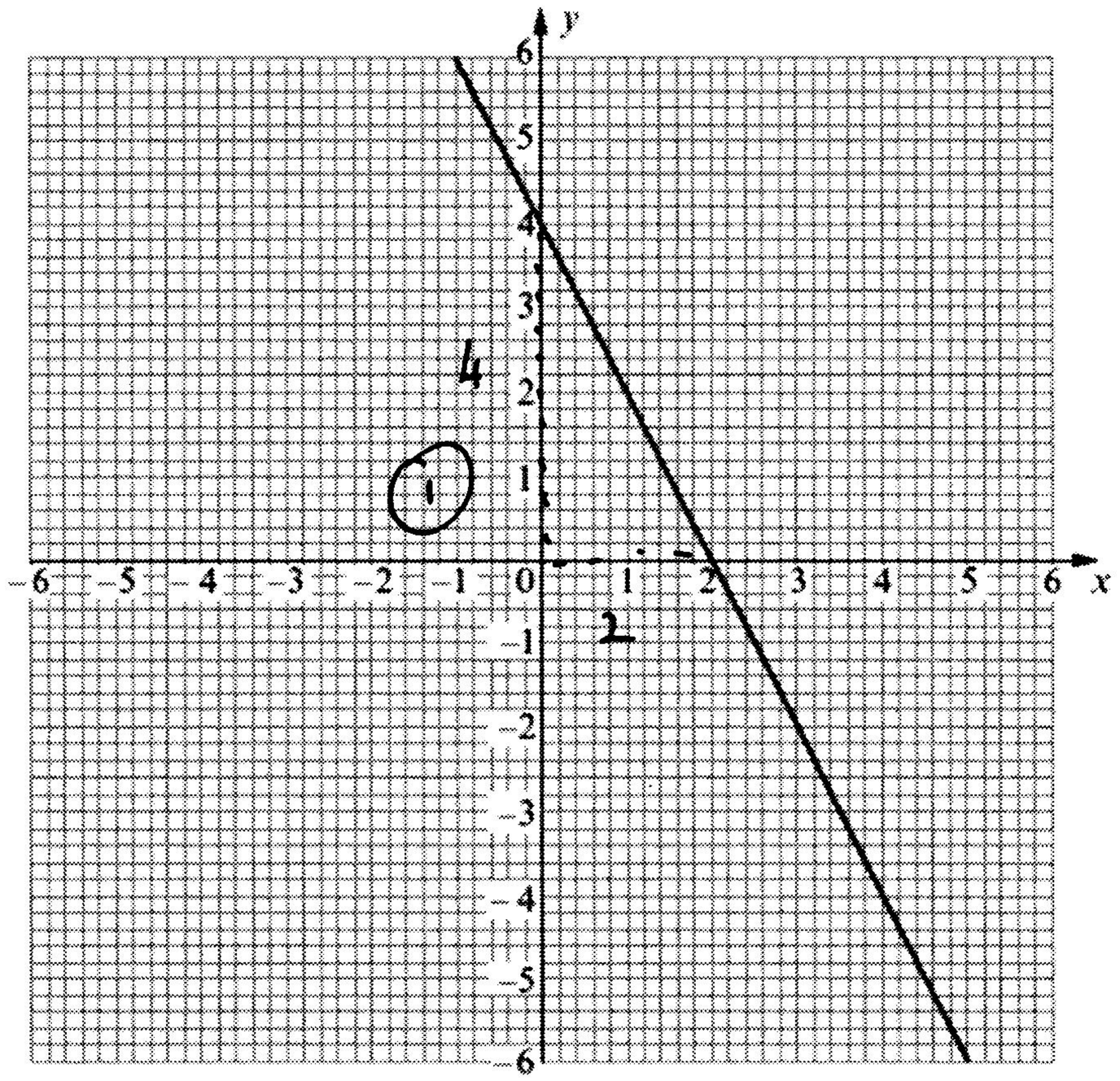
$x^3 - 6x^2 + 2x + 10 = 0$

$x^3 - 6x^2 + 3x + 10 = x$ ①

$x = -1{\cdot}2, 1{\cdot}8, 5{\cdot}2$ ②

[3]

7. *(a)* Find the equation of the straight line shown in the following diagram. Write your answer in the form $y = mx + c$.



Gradient $= \frac{4}{-2} = -2$ (1)

Equation of the straight line is $y =$ $-2x + 4$ (1)

[3]

(b) Write down the equation of a straight line that is parallel to $y = 5x$.

$y = 5x + 1$ (Any nº ± 5x) . (1)

[1]

(c) Find the mid-point of the straight line that joins the points with coordinates (2, –7) and (6, 13).

$2 \rightarrow 6$ ↓ 4 $\qquad$ $13 \rightarrow -7$ ↓ 3

(4 , 3)

(1) (1) (1) for both.

[3]

9. The table shows some of the values of $y = 4x^3 + 3$ for values of x from -2 to 2.

(a) Complete the table by finding the value of y for $x = -1$.

x	-2	-1	0	1	2
$y = 4x^3 + 3$	-29	-1	3	7	35

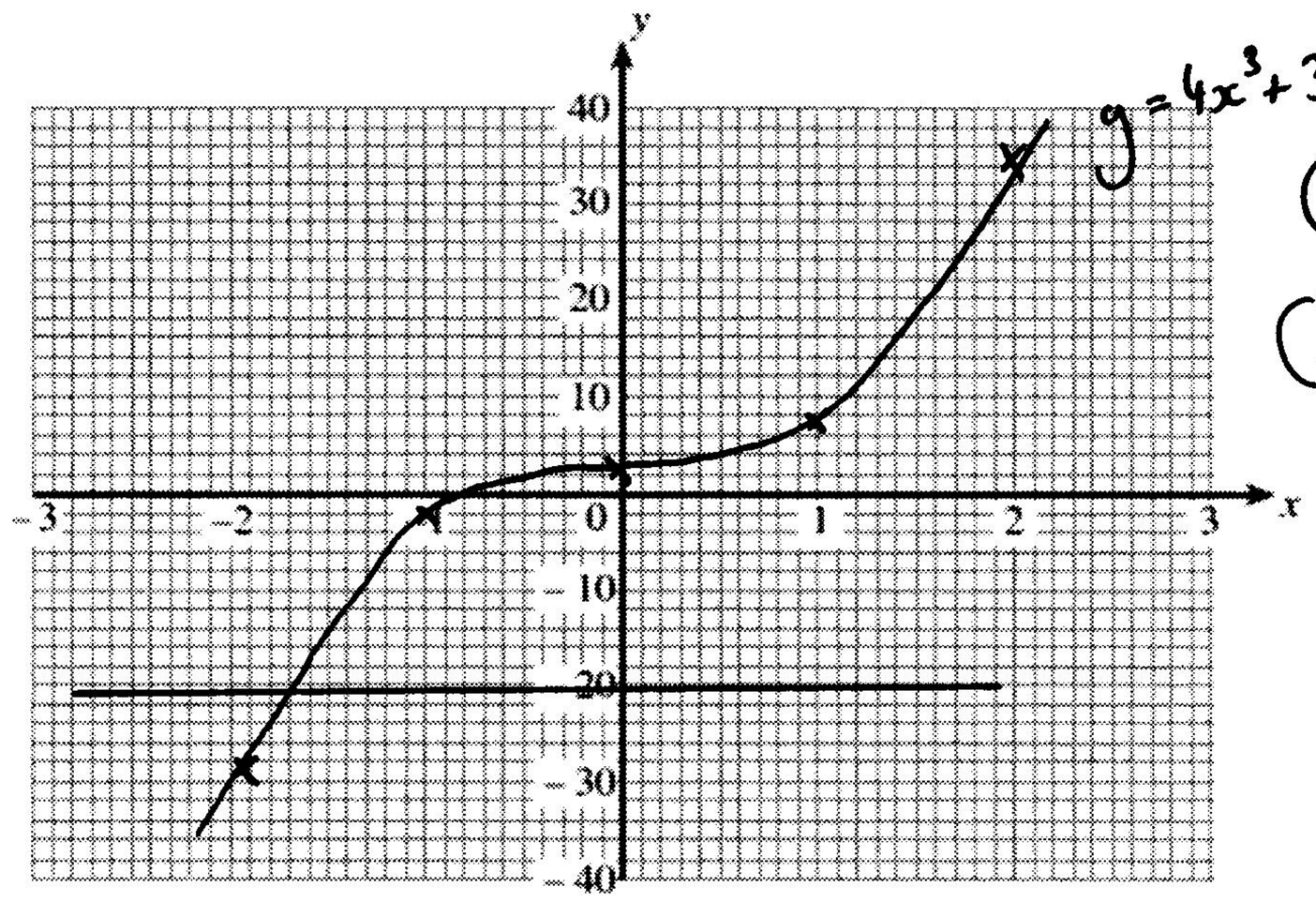
$x^3 = -1^3 = -1$ (1)

$-4 + 3 = -1$

[1]

(b) On the graph paper below, draw the graph of $y = 4x^3 + 3$ for values of x from -2 to 2.

[2]



(1) for points

(1) for curve.

(c) Use your graph of $y = 4x^3 + 3$ to find the value of x for which $4x^3 + 3 = -20$.

Draw $y = -20$ (1)

So $x = -1.8$ (1)

[2]

11. The table shows some of the values of $y = 2x^3 - 3$ for values of x from -2 to 2.

(a) Complete the table by finding the values of y for $x = -2$.

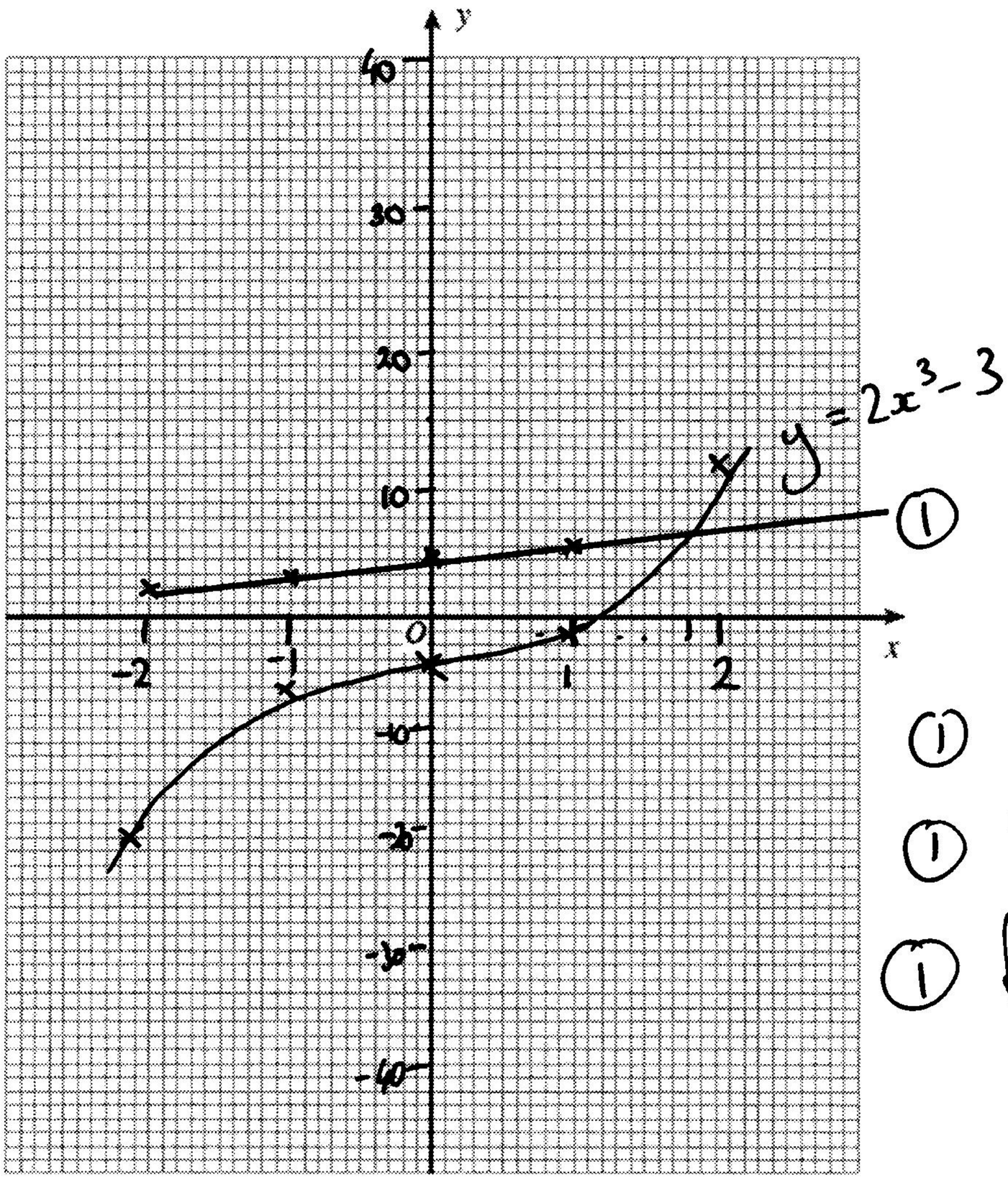
x	-2	-1	0	1	2
$y = 2x^3 - 3$	-19	-5	-3	-1	13

(1)

[1]

(b) On the graph paper below, draw the graph of $y = 2x^3 - 3$ for values of x between -2 and 2.

[3]



(1) for points
(1) for a scale
(1) for curve

(c) Write down the coordinates of the point of intersection of $y = 2x^3 - 3$ with the line $y = x + 4$.

$x = 1{\cdot}8$ (1)

[2]