

Constructing Graphs & Solving Equations Graphically

Question Paper 7

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Algebra and Graphs
Sub-Topic	Constructing Graphs & Solving Equations Graphically
Booklet	Question Paper 7

Time Allowed: 53 minutes

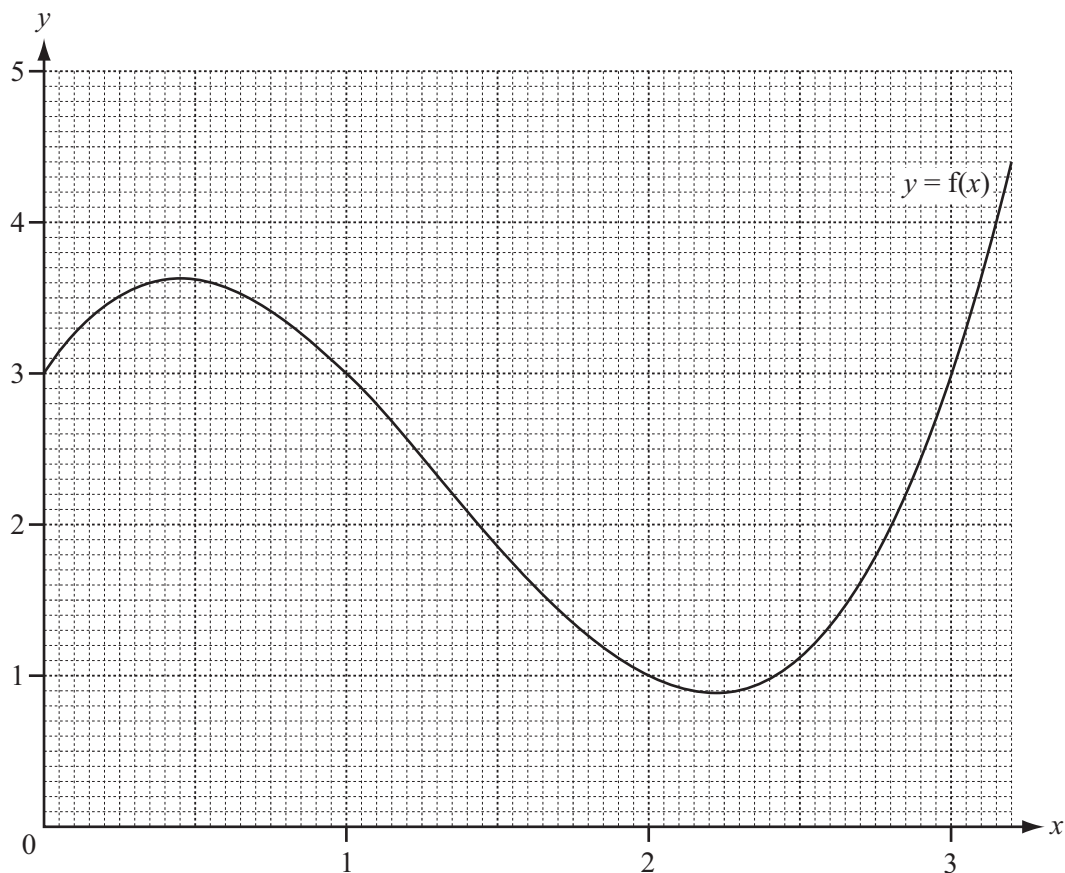
Score: /44

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1 The graph of $y = f(x)$ is drawn on the grid for $0 \leq x \leq 3.2$.



(a) (i) Draw the tangent to the curve $y = f(x)$ at $x = 2.5$. [1]

(ii) Use your tangent to estimate the gradient of the curve at $x = 2.5$.

Answer(a)(ii) [2]

(b) Use the graph to solve $f(x) = 2$, for $0 \leq x \leq 3.2$.

Answer(b) $x =$ or $x =$ [2]

(c)
$$g(x) = \frac{x}{2} + \frac{2}{x^2} \quad x \neq 0.$$

(i) Complete the table for values of $g(x)$, correct to 1 decimal place.

x	0.7	1	1.5	2	2.5	3
$g(x)$			1.6		1.6	1.7

[2]

(ii) On the grid opposite, draw the graph of $y = g(x)$ for $0.7 \leq x \leq 3$.

[3]

(iii) Solve $f(x) = g(x)$ for $0.7 \leq x \leq 3$.

Answer(c) (iii) $x =$ or $x =$ or $x =$ [3]

2

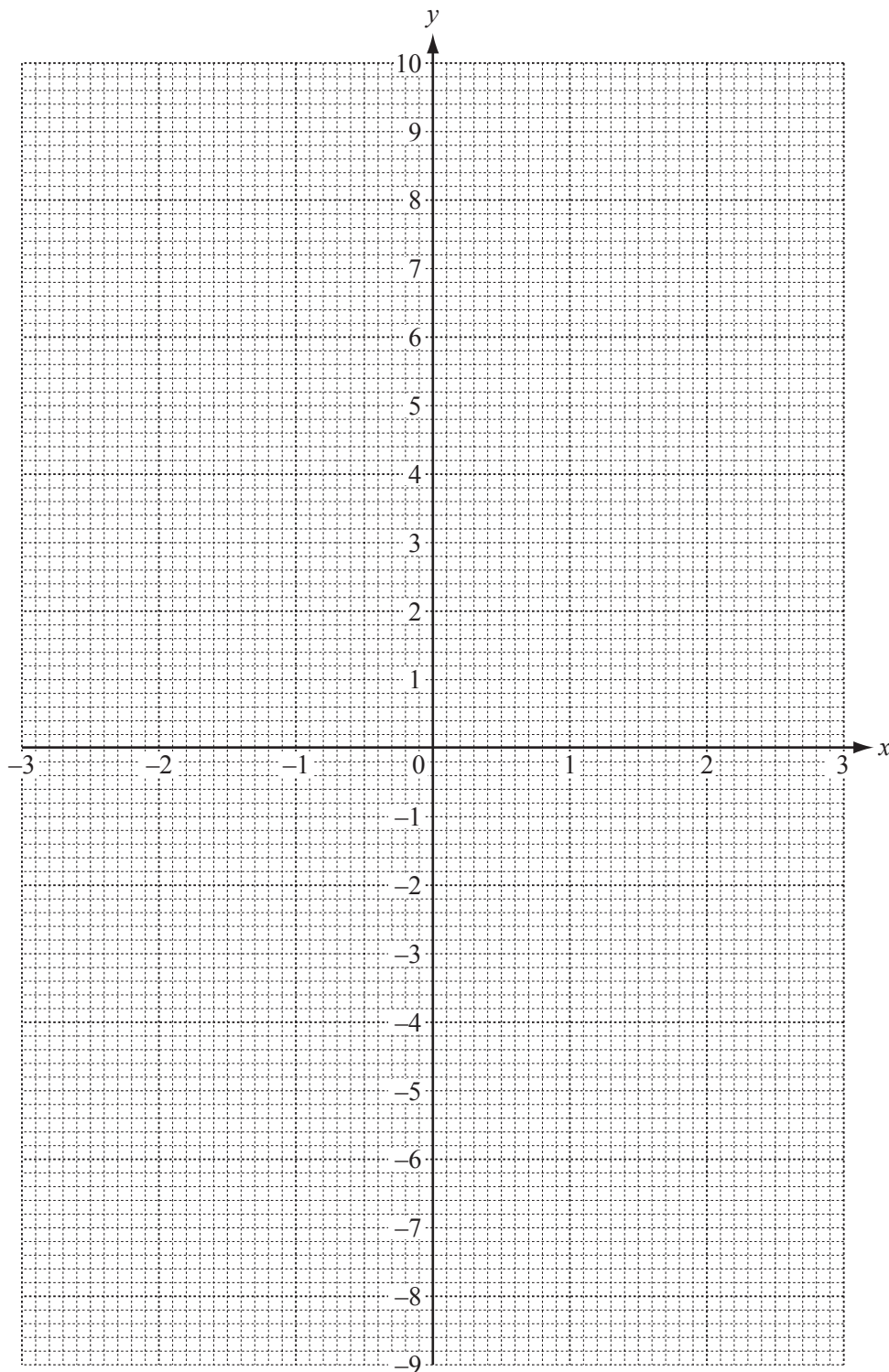
$$f(x) = \frac{2}{x^2} - 3x, \quad x \neq 0$$

(a) Complete the table.

x	-3	-2.5	-2	-1.5	-1	-0.5	0.5	1	1.5	2	2.5	3
$f(x)$	9.2	7.8	6.5	5.4		9.5	6.5		-3.6	-5.5	-7.2	-8.8

[2]

(b) On the grid, draw the graph of $y = f(x)$, for $-3 \leq x \leq -0.5$ and $0.5 \leq x \leq 3$.



[5]

(c) Use your graph to solve the equations.

(i) $f(x) = 4$

Answer(c)(i) $x =$ [1]

(ii) $f(x) = 3x$

Answer(c)(ii) $x =$ [2]

(d) The equation $f(x) = 3x$ can be written as $x^3 = k$.

Find the value of k .

Answer(d) $k =$ [2]

(e) (i) Draw the straight line through the points $(-1, 5)$ and $(3, -9)$. [1]

(ii) Find the equation of this line.

Answer(e)(ii) [3]

(ii) Complete the statement.

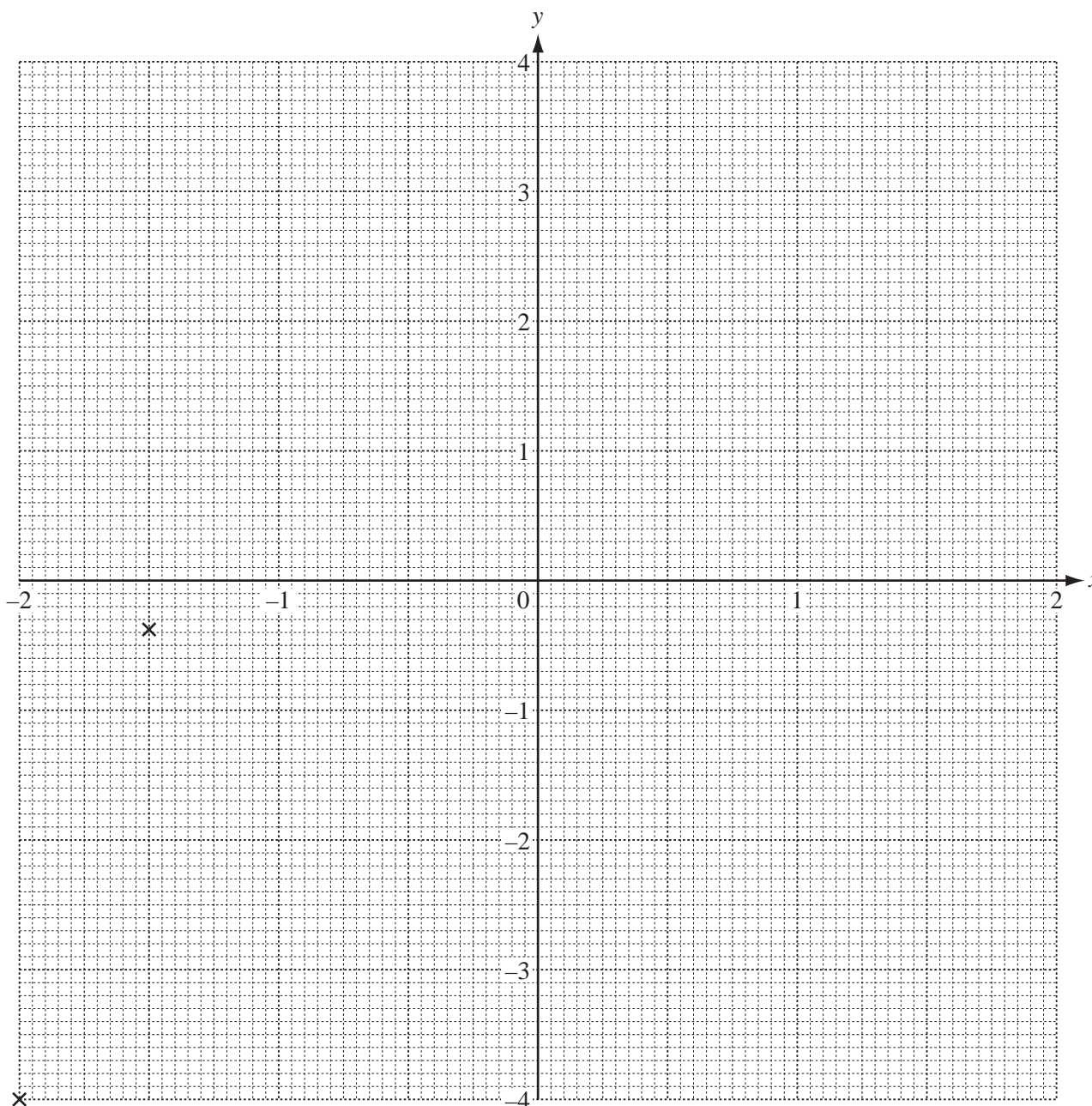
The straight line in **part (e)(ii)** is a to the graph of $y = f(x)$. [1]

3 The table shows some values for the equation $y = x^3 - 2x$ for $-2 \leq x \leq 2$.

x	-2	-1.5	-1	-0.6	-0.3	0	0.3	0.6			
y	-4	-0.38			0.57		-0.57			0.38	4

(a) Complete the table of values. [3]

(b) On the grid below, draw the graph of $y = x^3 - 2x$ for $-2 \leq x \leq 2$.
The first two points have been plotted for you.



[4]

(c) (i) On the grid, draw the line $y = 0.8$ for $-2 \leq x \leq 2$. [1]

(ii) Use your graph to solve the equation $x^3 - 2x = 0.8$.

Answer(c)(ii) $x =$ or $x =$ or $x =$ [3]

(d) By drawing a suitable tangent, work out an estimate for the gradient of the graph of $y = x^3 - 2x$ where $x = -1.5$.

You must show your working.

Answer(d) [3]

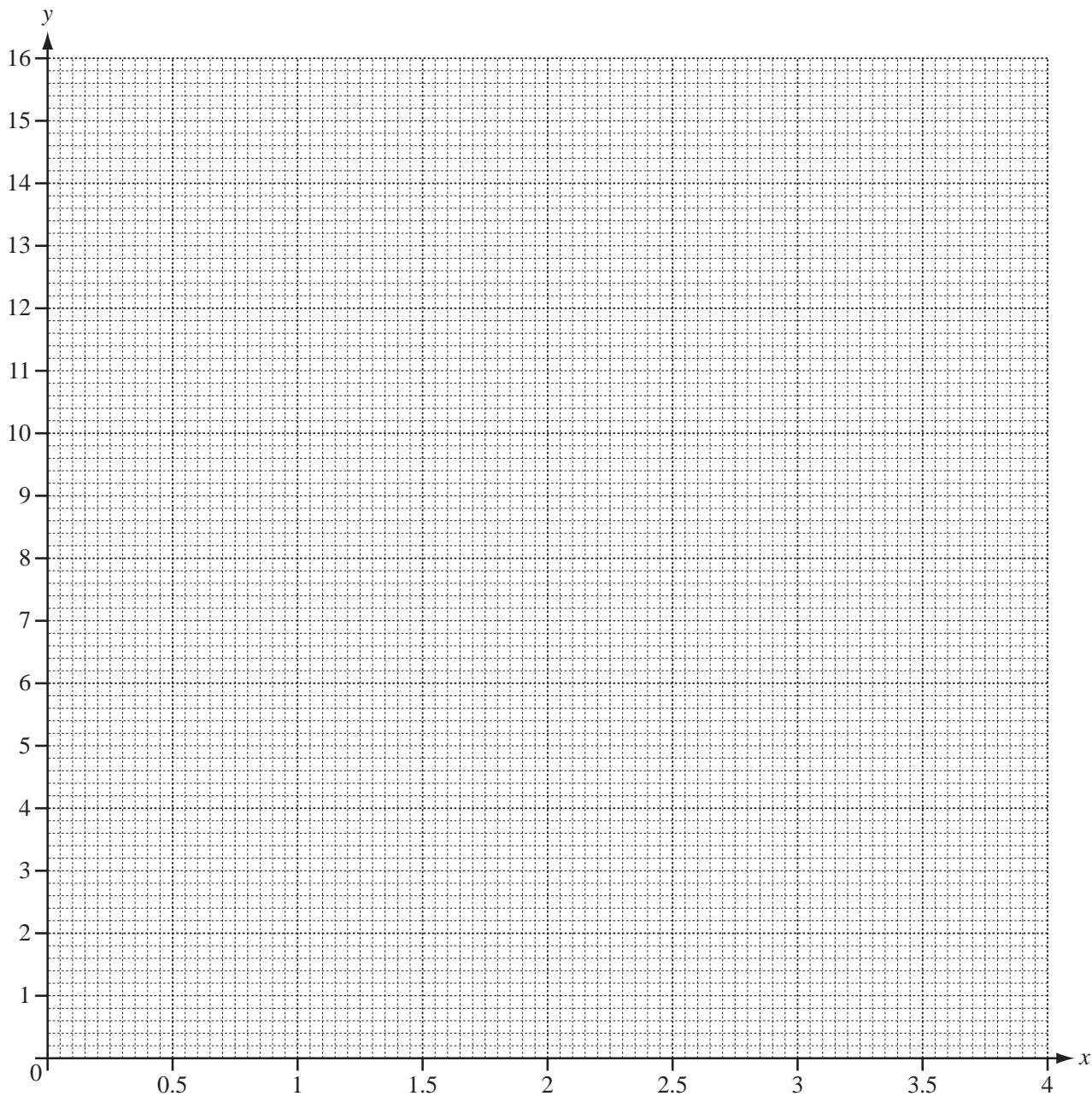
1 $f(x) = 2^x$

(a) Complete the table.

x	0	0.5	1	1.5	2	2.5	3	3.5	4
$f(x)$		1.4	2	2.8	4	5.7	8		

[3]

(b) Draw the graph of $y = f(x)$ for $0 \leq x \leq 4$.



[4]

(c) Use your graph to solve the equation $2^x = 5$.

Answer(c) $x =$ [1]

(d) Draw a suitable straight line and use it to solve the equation $2^x = 3x$.

Answer(d) $x =$ or $x =$ [3]

(e) Draw a suitable tangent and use it to find the co-ordinates of the point on the graph of $y = f(x)$ where the gradient of the graph is 3.

Answer(e) (..... ,) [3]