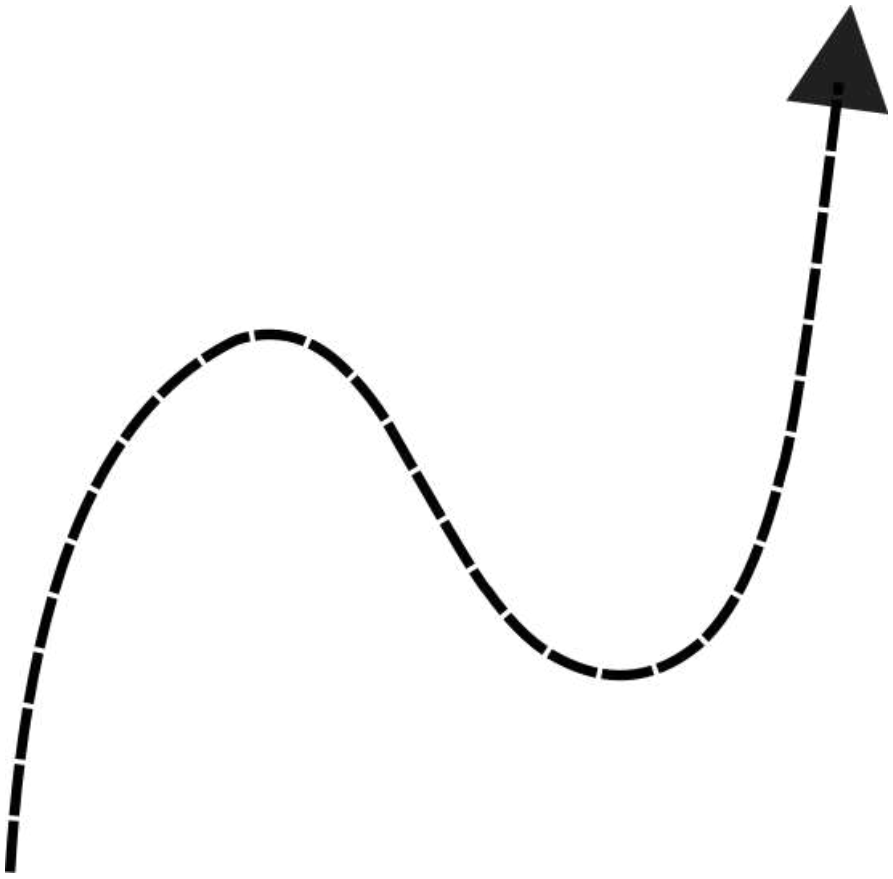
EDEXCEL IGCSE MATHEMATICS

UNIT 2 (MODULAR)

GRAPHS – GRAPHS OF FUNCTIONS

QP & MS (2018 - 2025)



COMPILED BY:
SIR MUHAMMAD ABDULLAH SHAH

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by Sir Muhammad Abdullah Shah

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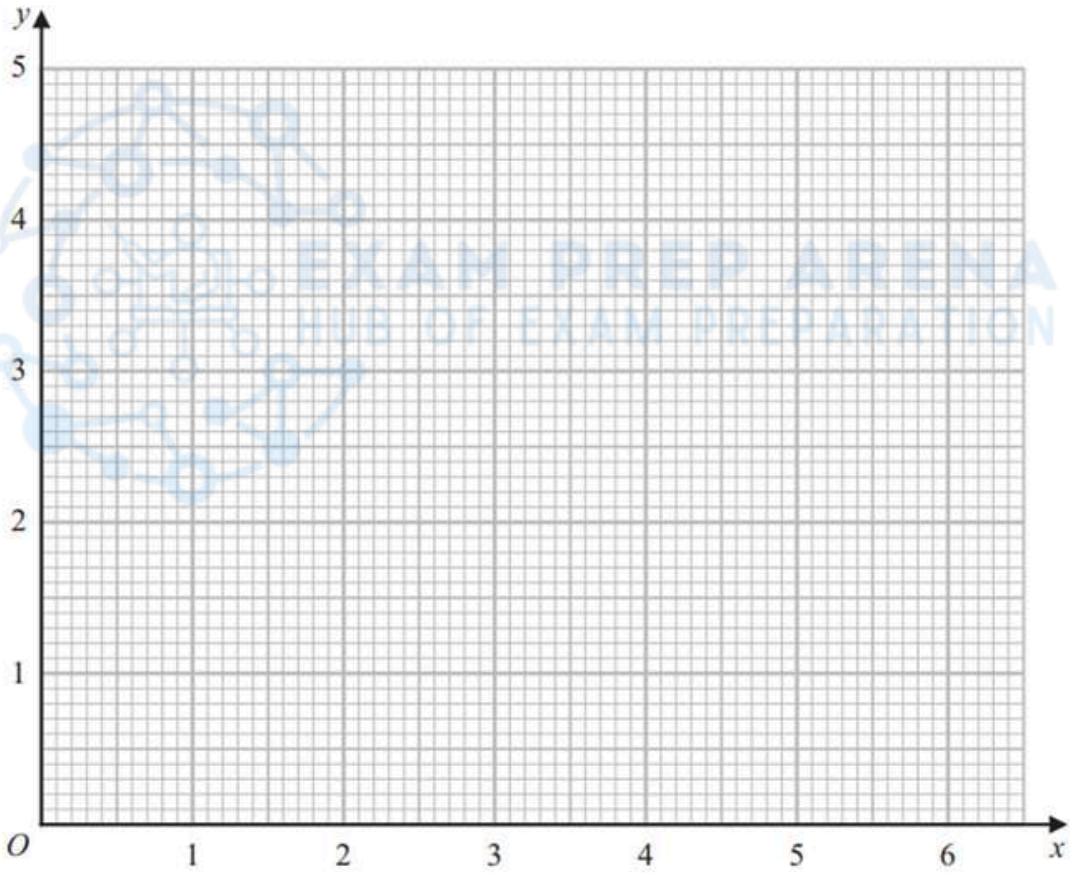
1. Nov 2025 2H/Q12

(a) Complete the table of values for $y = \frac{1}{2}\left(x + \frac{4}{x}\right)$

x	0.5	1	2	3	4	5	6
y	4.25			2.17	2.5	2.9	3.33

(1)

(b) Draw the graph of $y = \frac{1}{2}\left(x + \frac{4}{x}\right)$ for $0.5 \leqslant x \leqslant 6$



(2)

(c) By drawing a suitable line on the grid, find estimates for the solutions of

the equation $x + \frac{4}{x} = 6$

Give your answers correct to one decimal place.

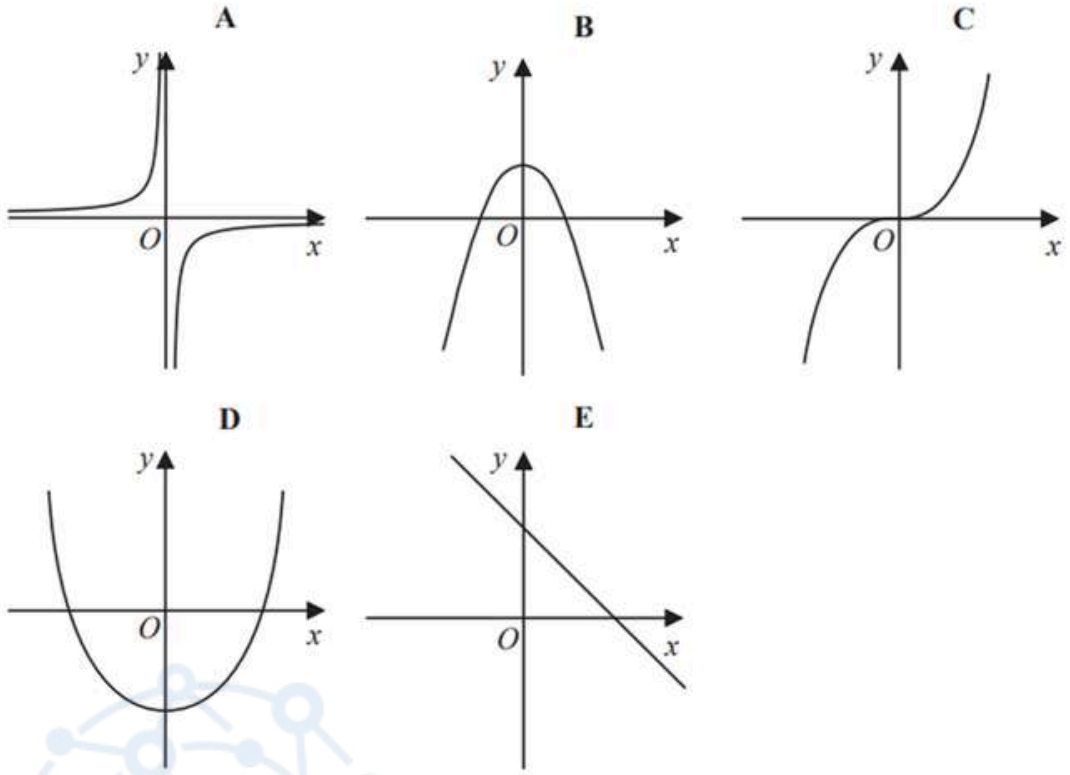
.....

(2)

(Total for Question 12 is 5 marks)

2. June 2025 2H/Q14

Here are five graphs.



(a) Write down the letter of the graph that could have the equation $y = 5 - x^2$

.....

(1)

(b) Write down the letter of the graph that could have the equation $y = 2x^3$

.....

(1)

(Total for Question 14 is 2 marks)

3. June 2025 2H/Q25

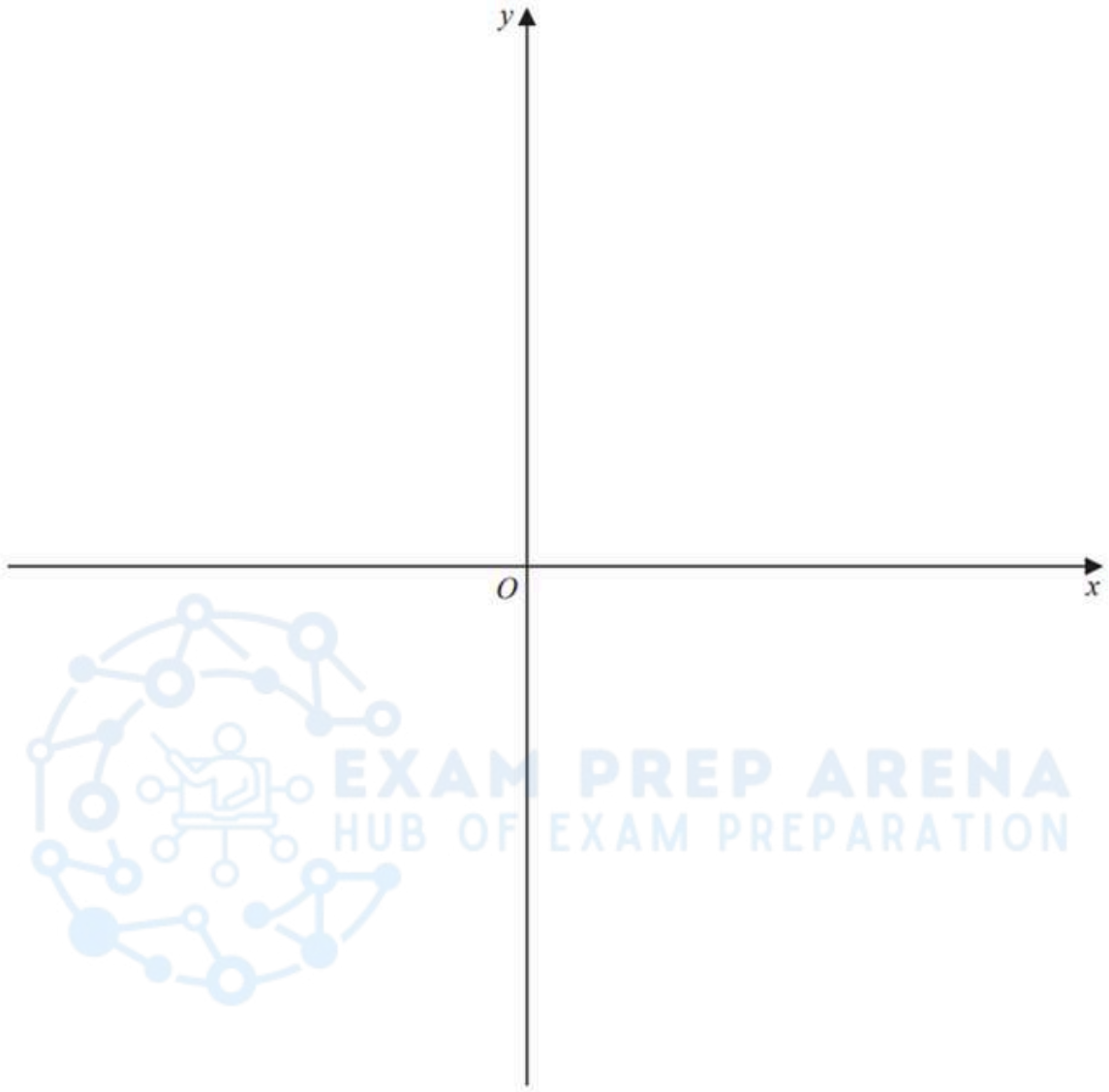
(a) Write $28+24x-6x^2$ in the form $a-b(x-c)^2$ where a, b and c are integers.

.....

(3)

(b) On the axes below, sketch the graph of $y = 28 + 24x - 6x^2$

Show clearly the coordinates of the turning point and the coordinates of the point of intersection of the graph with the y-axis.

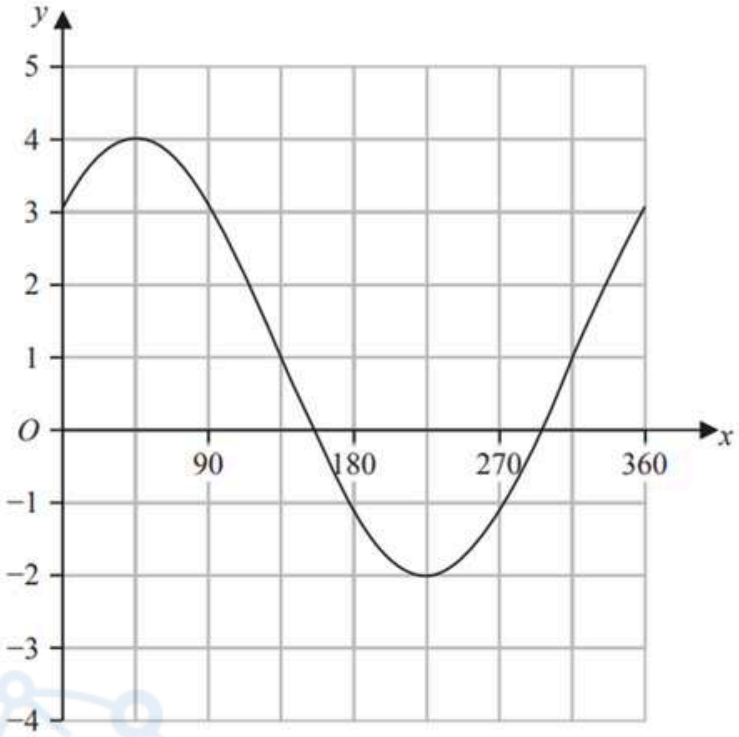


(3)

(Total for Question 25 is 6 marks)

4. June 2025 2HR/Q25

The graph of $y = a\sin(x + b)^\circ + c$ for $0 \leqslant x \leqslant 360$ is drawn on the grid below.



Find a suitable value for a, for b and for c

$a =$ .....

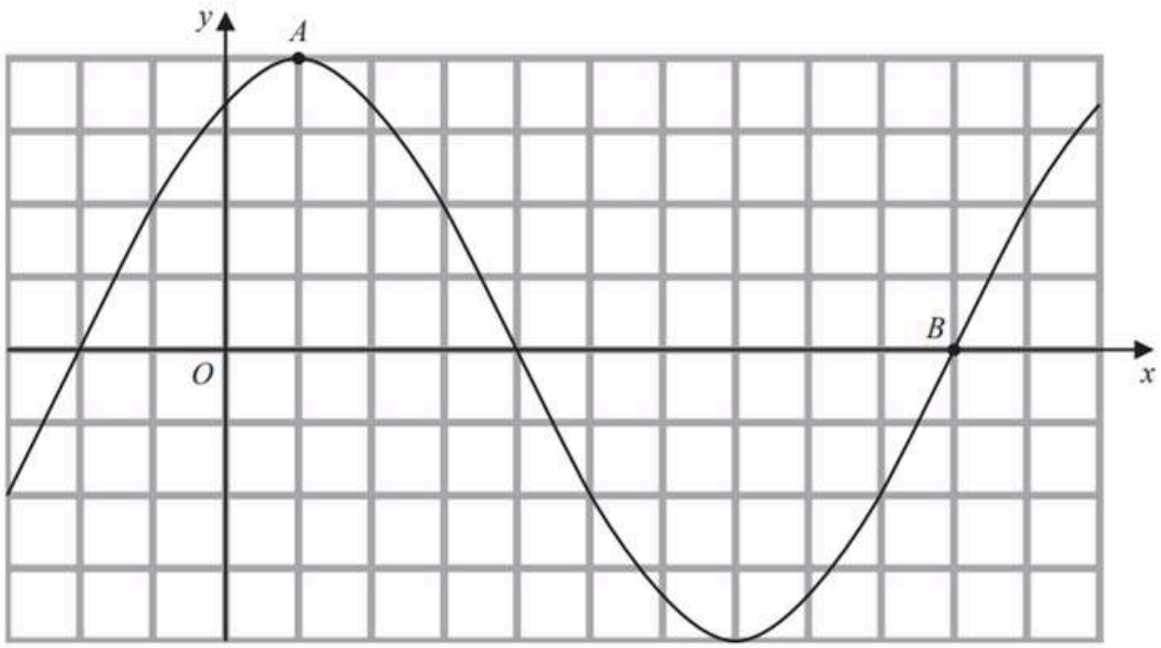
$b =$ .....

$c =$ .....

(Total for Question 25 is 3 marks)

5. June 2024 2H/Q25

The diagram shows a sketch of the graph of $y = 2\sin(x + 60)°$



(i) Find the coordinates of the point A

(.....,.....)
(1)

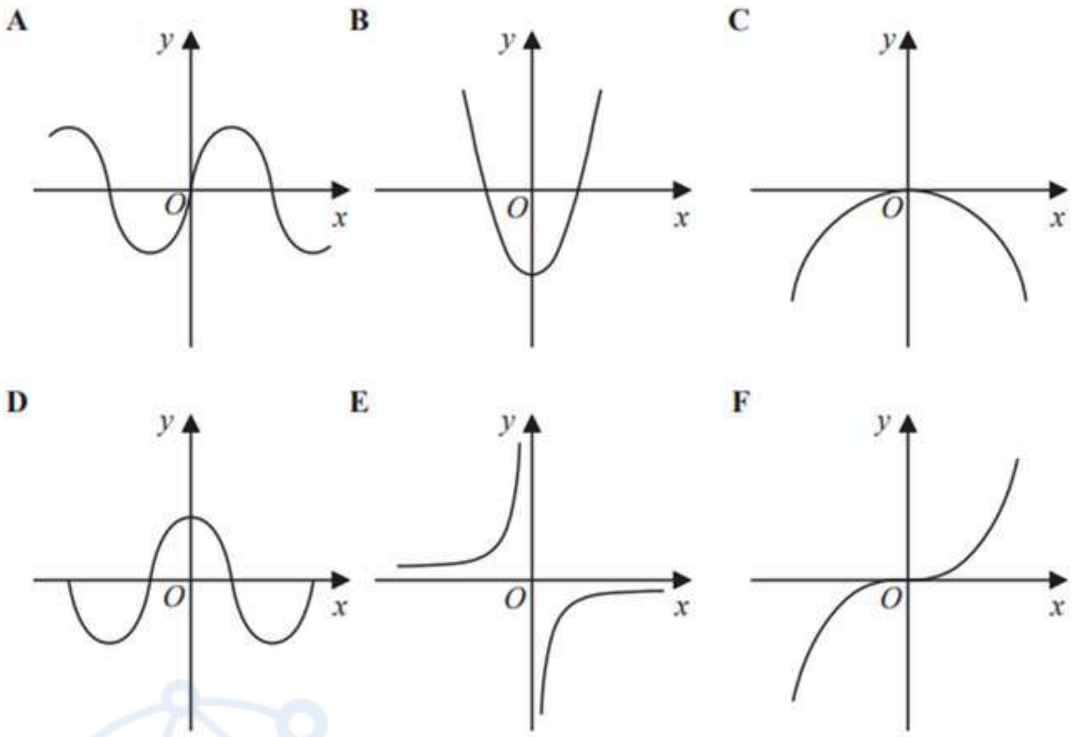
(ii) Find the coordinates of the point B

(.....,.....)
(1)

(Total for Question 25 is 2 marks)

6. June 2024 2HR/Q16

Here are six graphs.



Write down the letter of the graph that could have the equation

(i) $y = -\frac{1}{x}$

.....

(1)

(ii) $y = \sin x°$

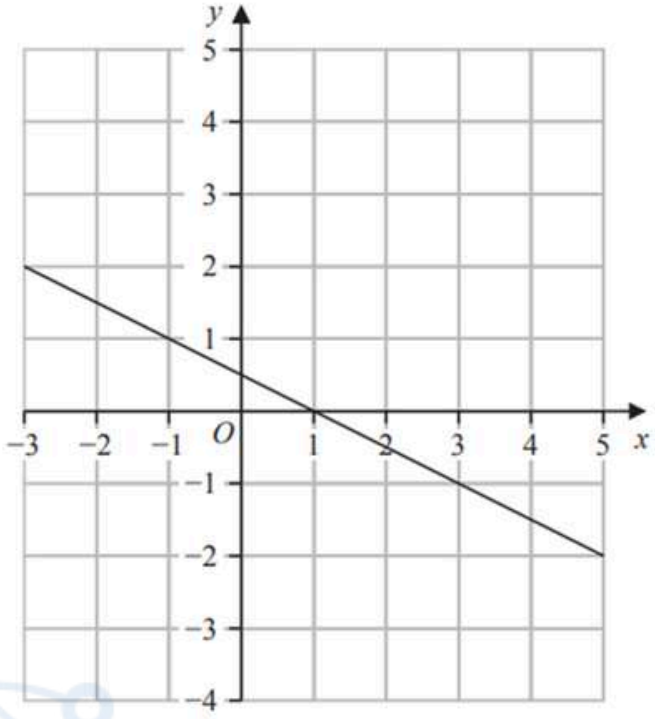
.....

(1)

(Total for Question 16 is 2 marks)

7. Nov 2023 2H/Q14

Here is the graph of the equation $2y+x=1$ drawn on a grid.



By drawing another straight line on the grid, solve the simultaneous equations

$$y-x-2=0$$
$$2y+x=1$$

$x =$ .....

$y =$ .....

(Total for Question 14 is 3 marks)

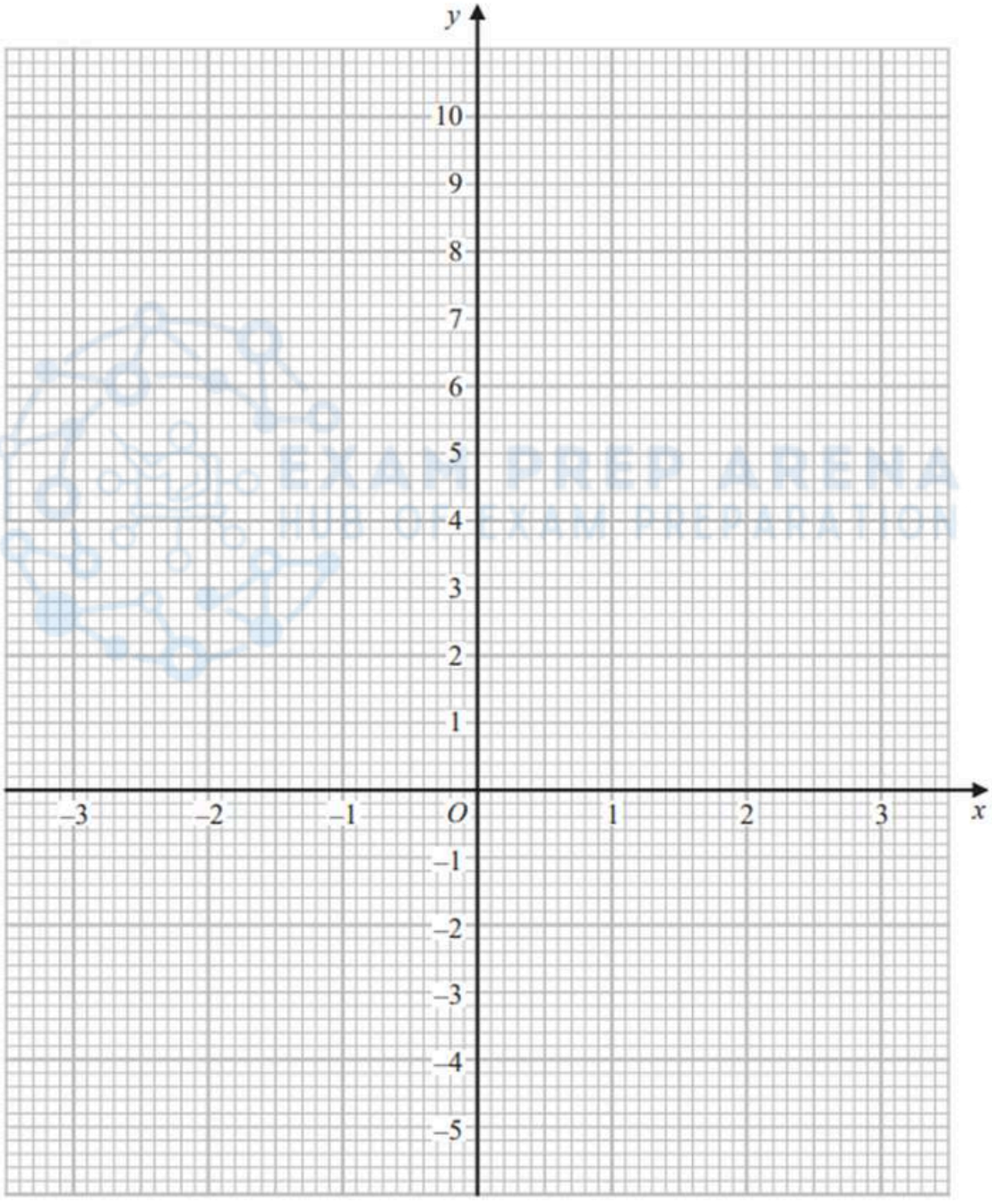
8. June 2023 2H/Q4

(a) Complete the table of values for $y = x^2 - x - 4$

x	–3	–2	–1	0	1	2	3
y		2			–4		

(2)

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

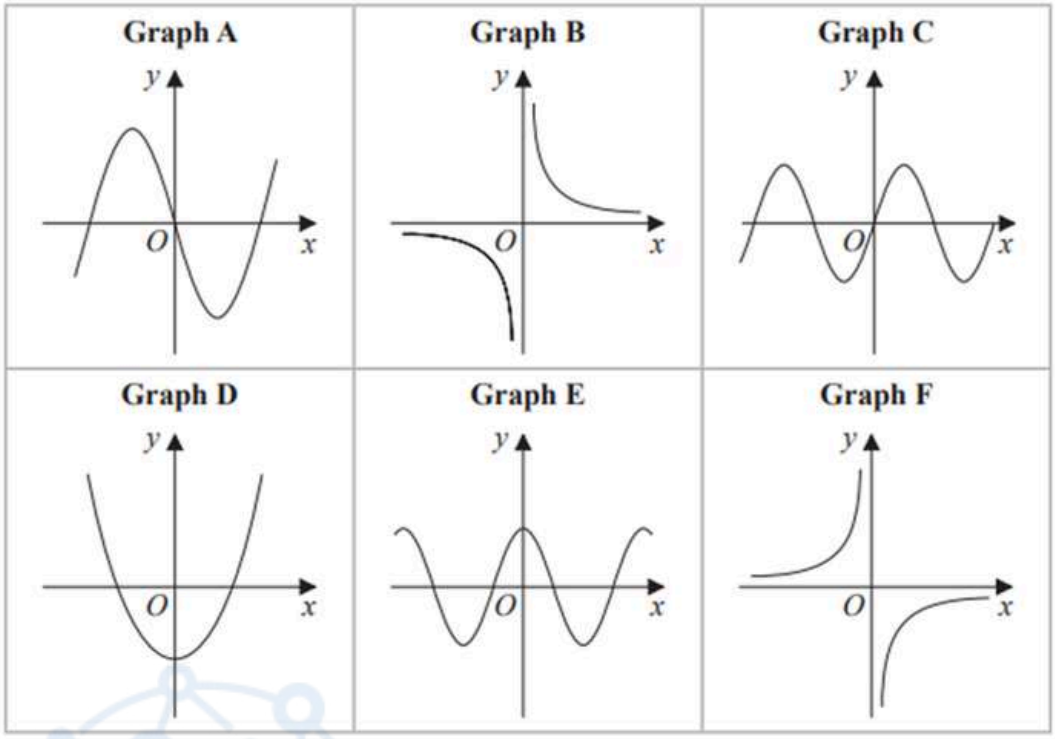


(2)

(Total for Question 4 is 4 marks)

9. June 2023 2H/Q18

Here are 6 graphs.



Complete the table below with the letter of the graph that could represent each given equation.

Write your answers on the dotted lines.

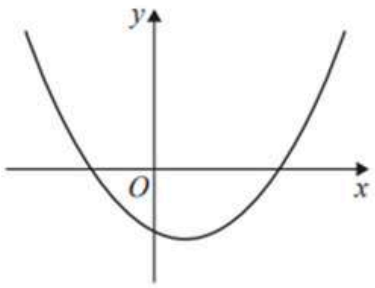
Equation	Graph
$y = \sin x$	.....
$y = -\frac{3}{x}$	.....
$y = 4x^3 - 5x$	.....

(Total for Question 18 is 3 marks)

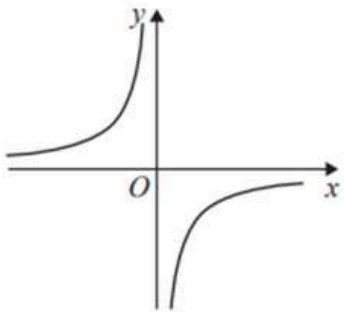
10. June 2023 2HR/Q12

Here are six graphs.

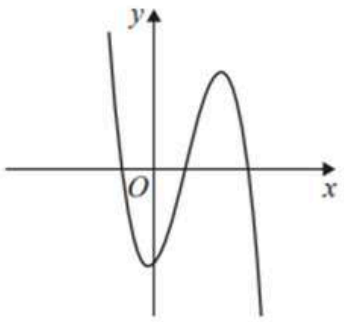
Graph **A**



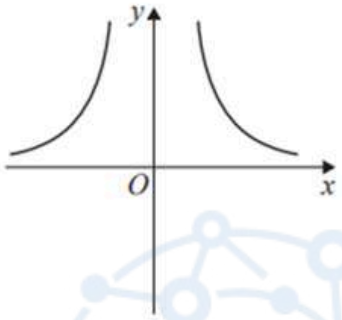
Graph **B**



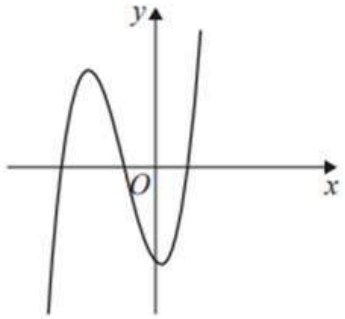
Graph **C**



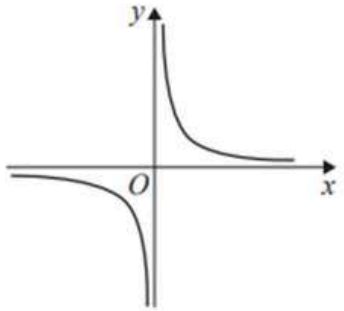
Graph **D**



Graph **E**



Graph **F**



Write down the letter of the graph of

(a) $y = \frac{10}{x^2}$

.....

(1)

(b) $y = x - 3 + 3x^2 - x^3$

.....

(1)

(c) $y = -\frac{3}{x}$

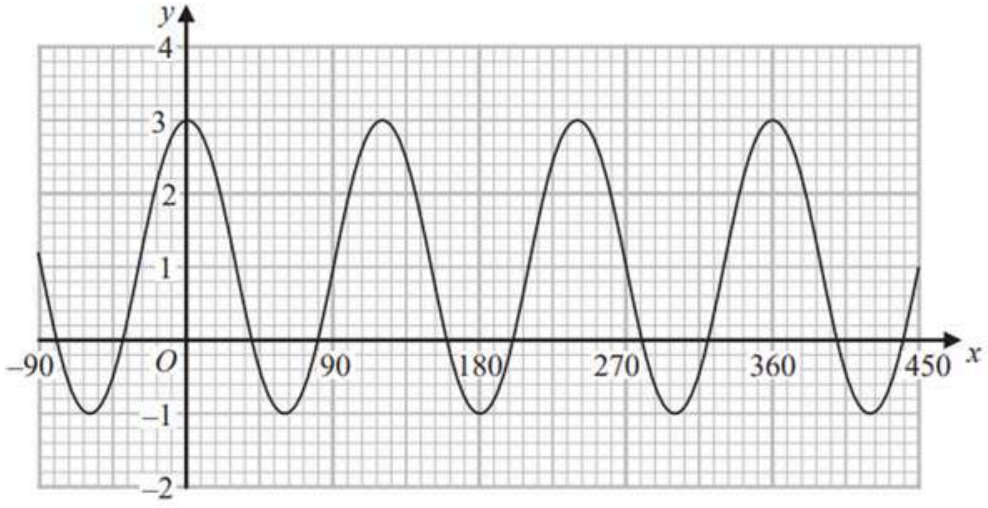
.....

(1)

(Total for Question 12 is 3 marks)

11. June 2023 2HR/Q26

Here is a sketch of the curve with equation $y = a\cos bx° + c$ where $-90 \leqslant x \leqslant 450$



Find the value of a, the value of b and the value of c

$a =$ .....

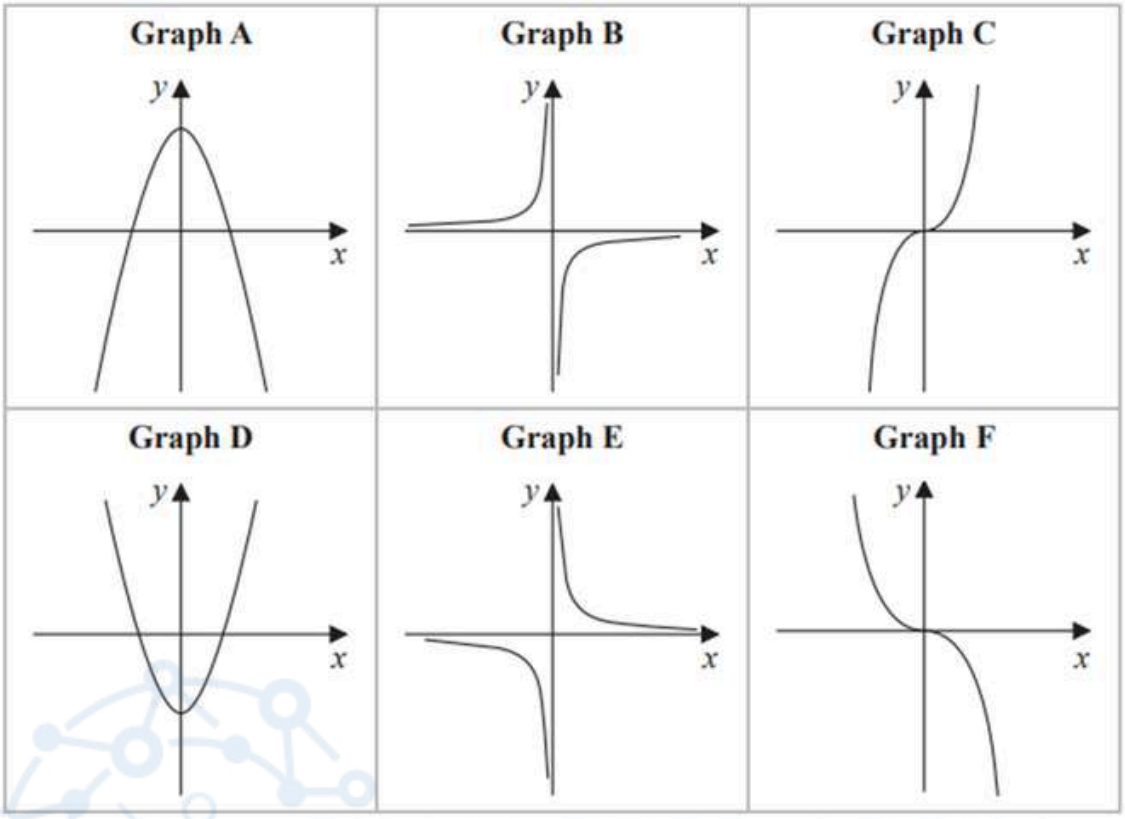
$b =$ .....

$c =$ .....

(Total for Question 26 is 3 marks)

12. Jan 2023 2H/Q11

Here are six graphs.



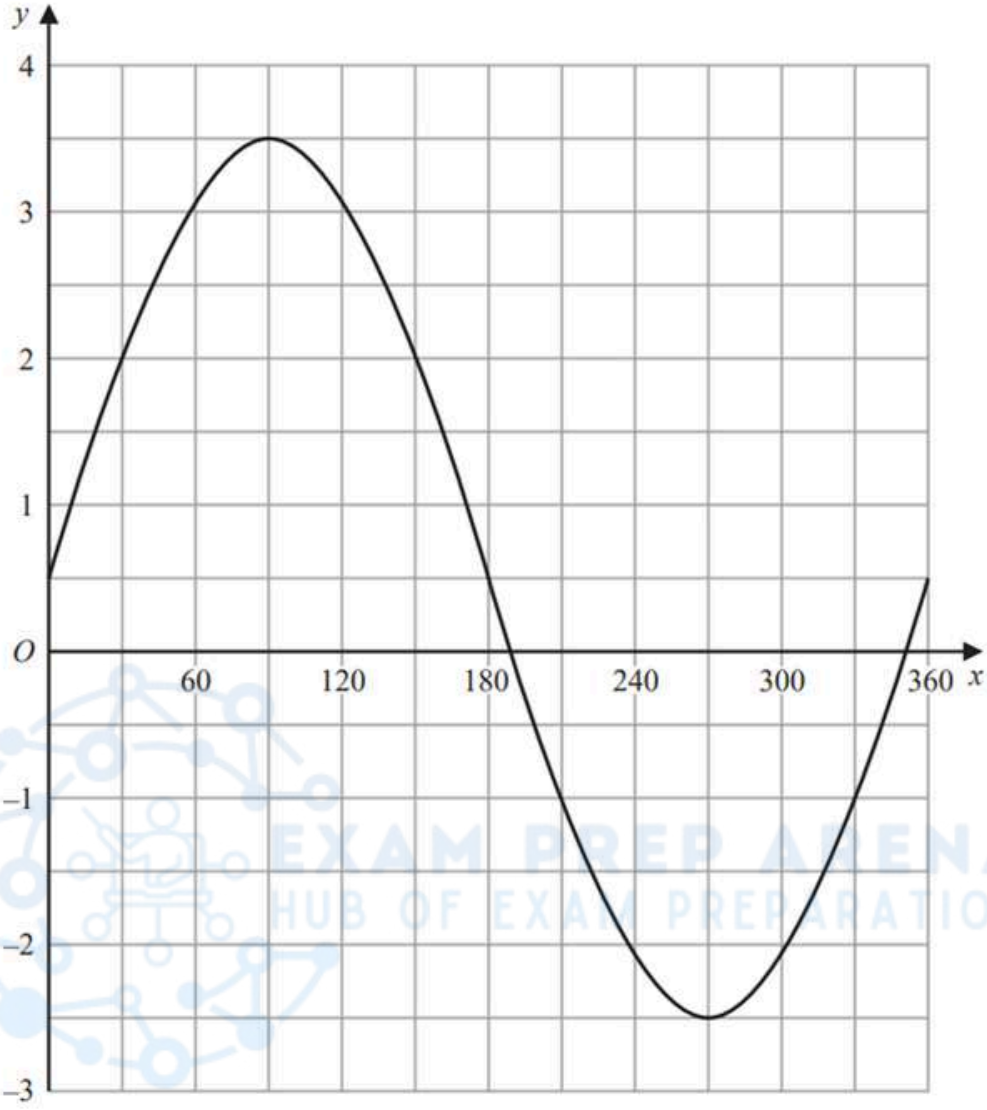
Complete the table below with the letter of the graph that could represent each given equation.
Write your answers on the dotted lines.

Equation	Graph
$y = -\frac{2}{x}$	.....
$y = 5 - x^2$	.....
$y = -2x^3$	.....

(Total for Question 11 is 3 marks)

13. Jan 2023 2H/Q24

The graph of $y = a\sin x° + b$ is drawn on the grid.



Find the value of a and the value of b

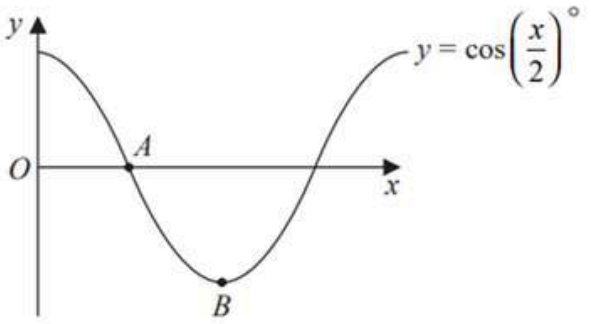
$a =$ .....

$b =$ .....

(Total for Question 24 is 2 marks)

14. June 2022 2H/Q23

The diagram shows a sketch of the graph of $y = \cos\left(\frac{x}{2}\right)^\circ$



(i) Find the coordinates of the point A

(.....,.....)
(1)

(ii) Find the coordinates of the point B

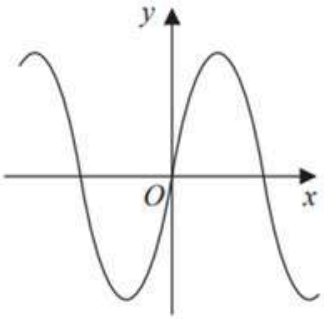
(.....,.....)
(1)

(Total for Question 23 is 2 marks)

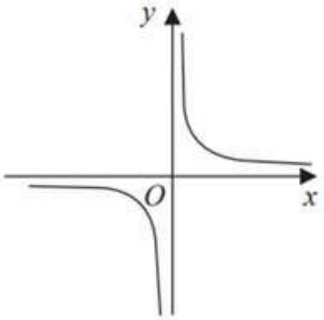
15. June 2022 2HR/Q16

Here are nine graphs.

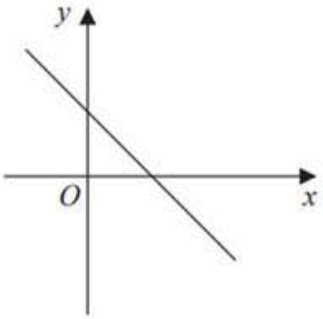
Graph A



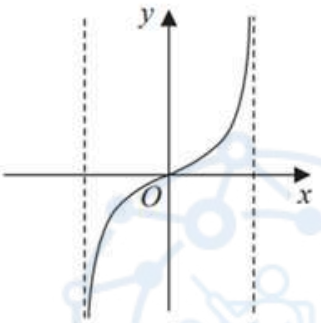
Graph B



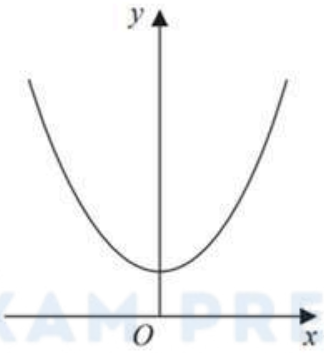
Graph C



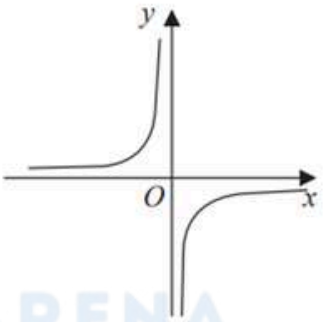
Graph D



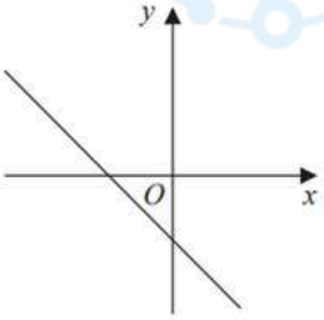
Graph E



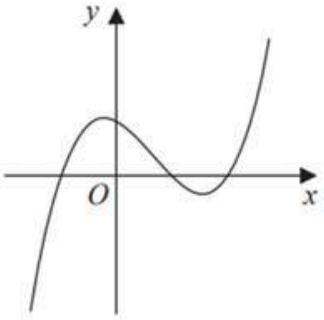
Graph F



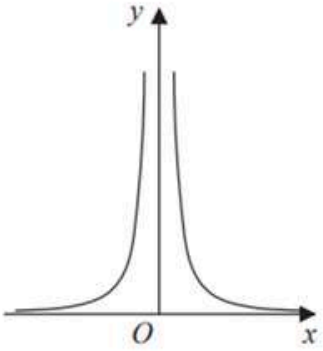
Graph G



Graph H



Graph I



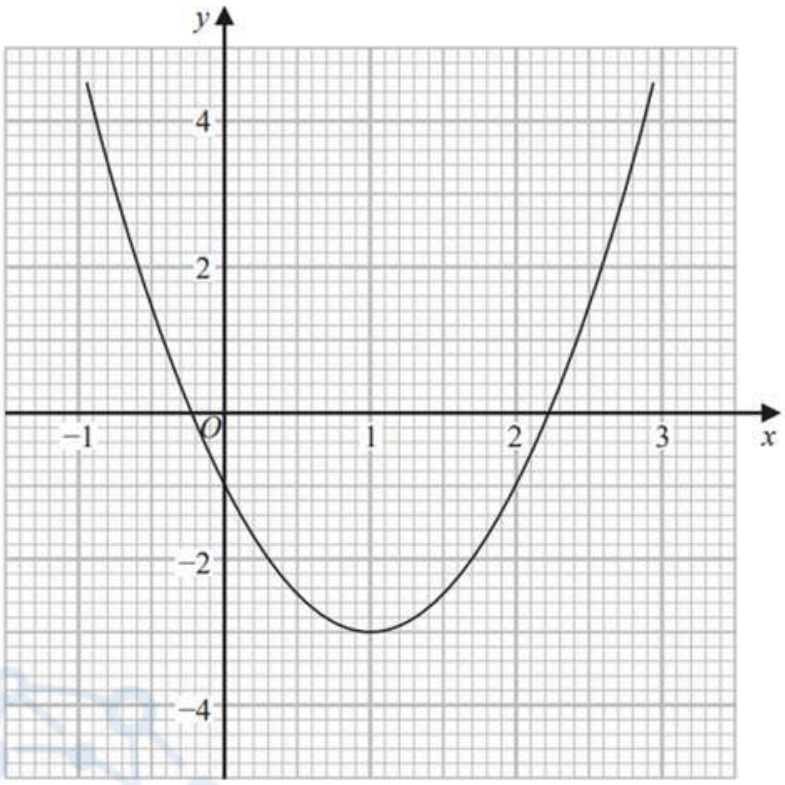
Complete the table below with the letter of the graph that could represent each given equation.
Write each answer on the dotted line.

Equation	Graph
$y = -2x + 3$	.....
$y = -\frac{1}{x}$	.....
$y = \tan x°$	.....
$y = (x + 1)(x - 1)(x - 2)$	.....

(Total for Question 16 is 3 marks)

16. Jan 2022 2H/Q21

Part of the graph of $y = 2x^2 - 4x - 1$ is shown on the grid.



(a) Use the graph to find estimates for the solutions of the equation $2x^2 - 4x - 1 = 0$
Give your solutions correct to one decimal place.

.....

(2)

(b) By drawing a suitable straight line on the grid, find estimates for the solutions of the equation $x^2 - x - 1 = 0$
Show your working clearly.
Give your solutions correct to one decimal place.

.....

(3)

(Total for Question 21 is 5 marks)

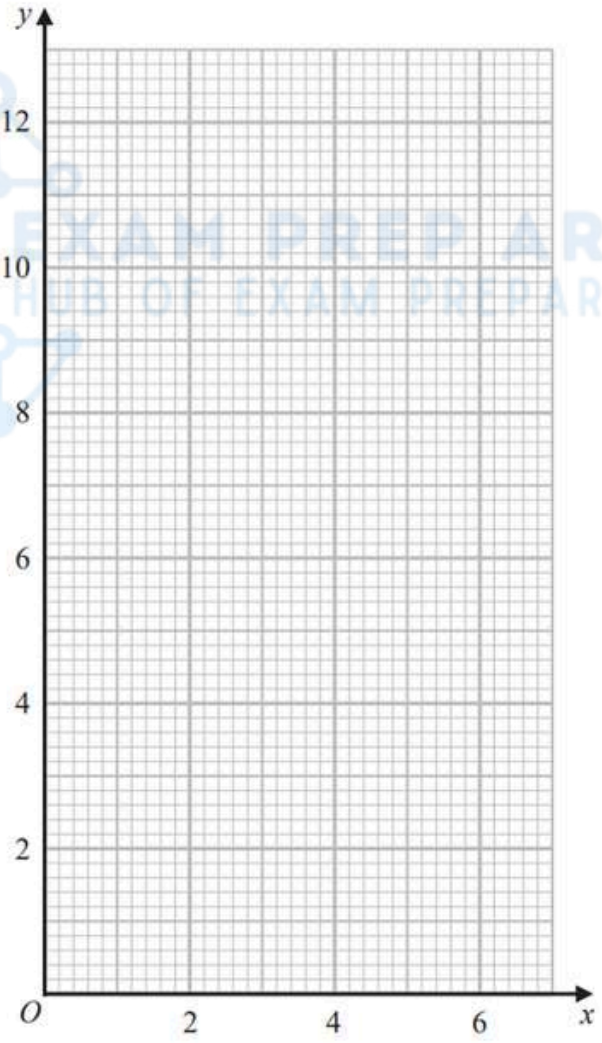
17. Jan 2022 2HR/Q11

(a) Complete the table of values for $y = \frac{6}{x}$

x	0.5	1	2	3	4	5	6
y		6		2			1

(2)

(b) On the grid, draw the graph of $y = \frac{6}{x}$ for $0.5 \leqslant x \leqslant 6$



(2)

(Total for Question 11 is 4 marks)

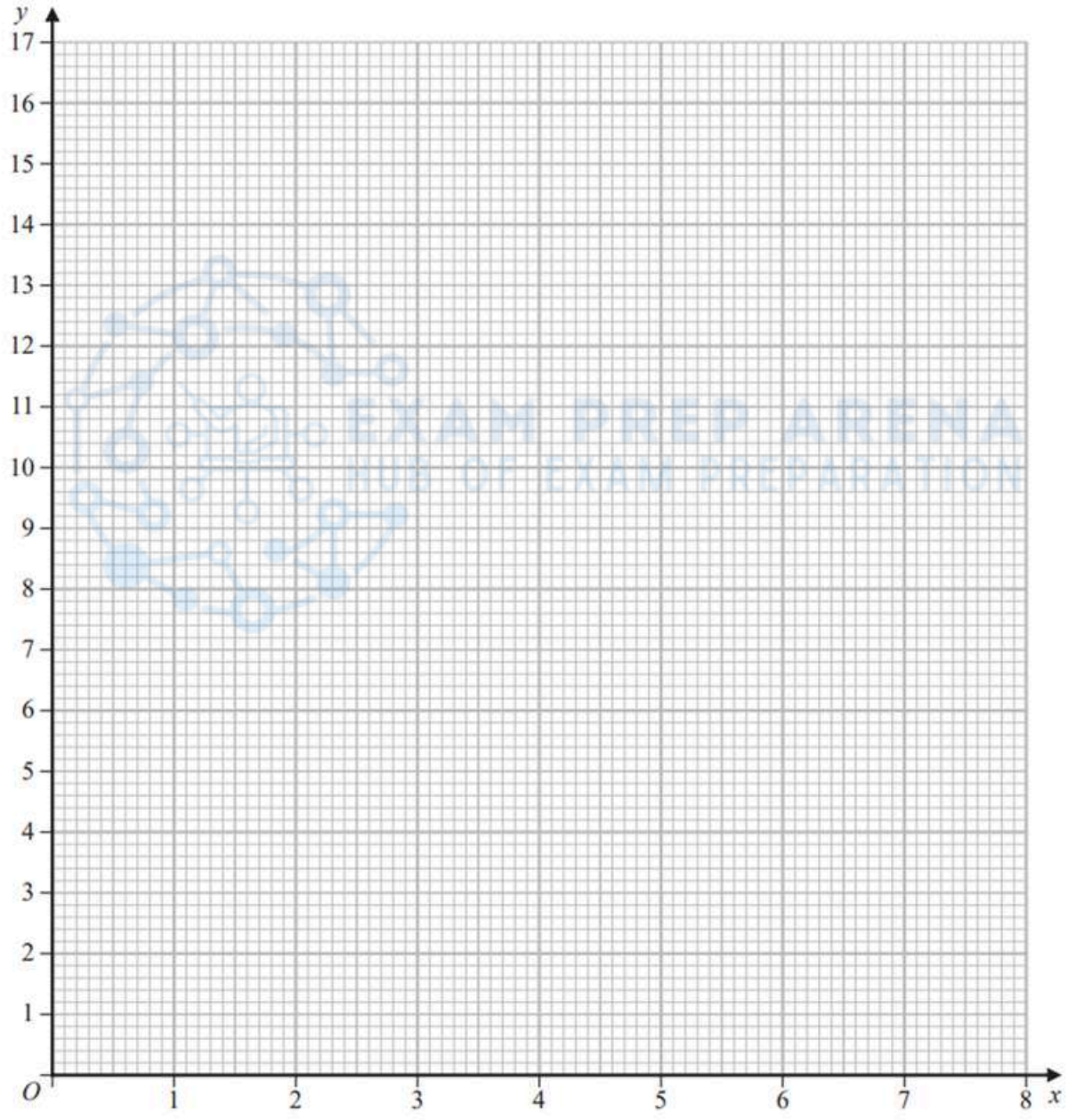
18. May 2021 2H/Q15

(a) Complete the table of values for $y = \frac{1}{x}(x^2 + 4)$

x	0.25	0.5	1	2	4	8
y	16.25					8.5

(2)

(b) On the grid, draw the graph of $y = \frac{1}{x}(x^2 + 4)$ for $0.25 \leqslant x \leqslant 8$



(2)

(Total for Question 15 is 4 marks)

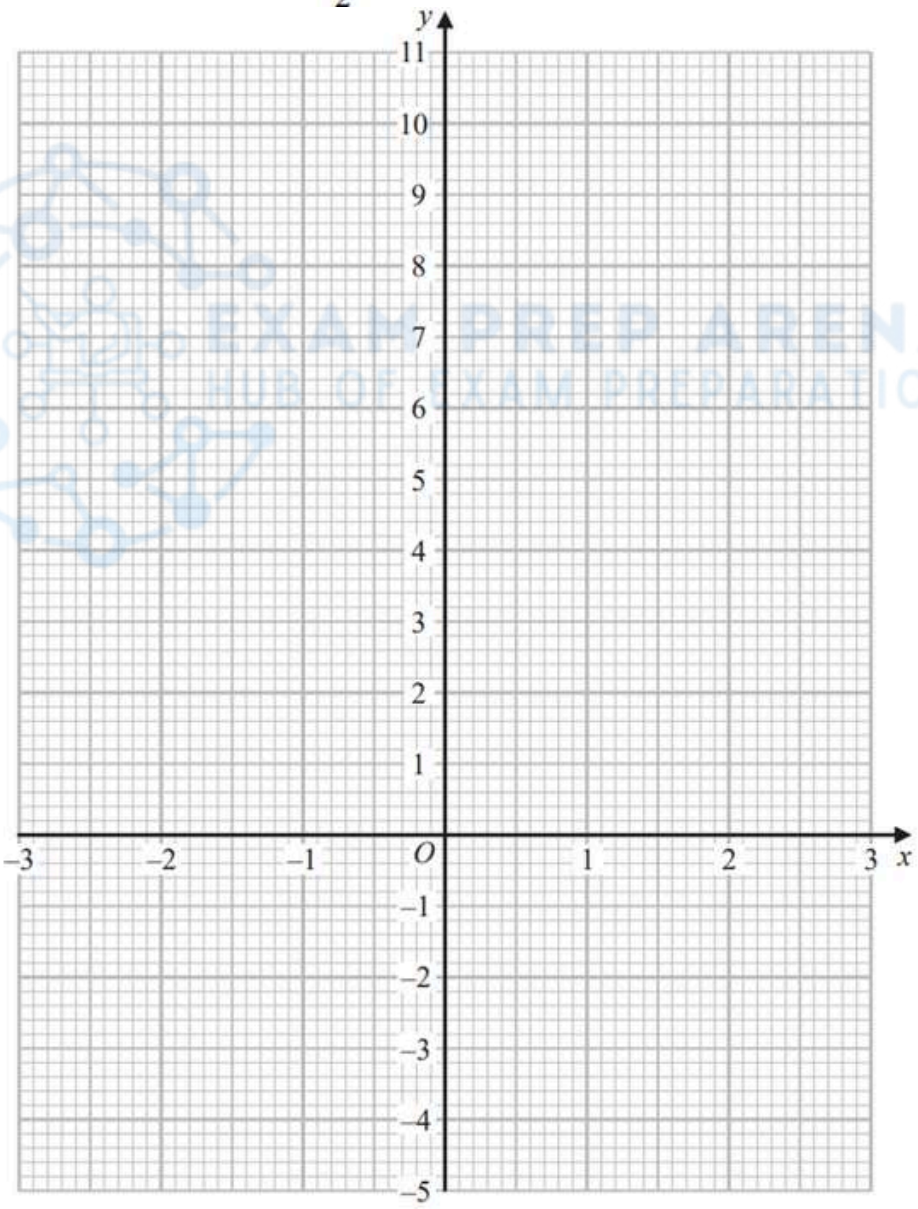
19. Nov 2020 2HR/Q18

(a) Complete the table of values for $y = \frac{1}{2}x^3 - 2x + 3$

x	–3	–2	–1	0	1	2	3
y	–4.5			3		3	

(2)

(b) On the grid, draw the graph of $y = \frac{1}{2}x^3 - 2x + 3$ for $-3 \leqslant x \leqslant 3$



(2)

(c) By drawing a suitable straight line on the grid, find an estimate for the solution of the equation $\frac{1}{2}x^3 - x + 4 = 0$

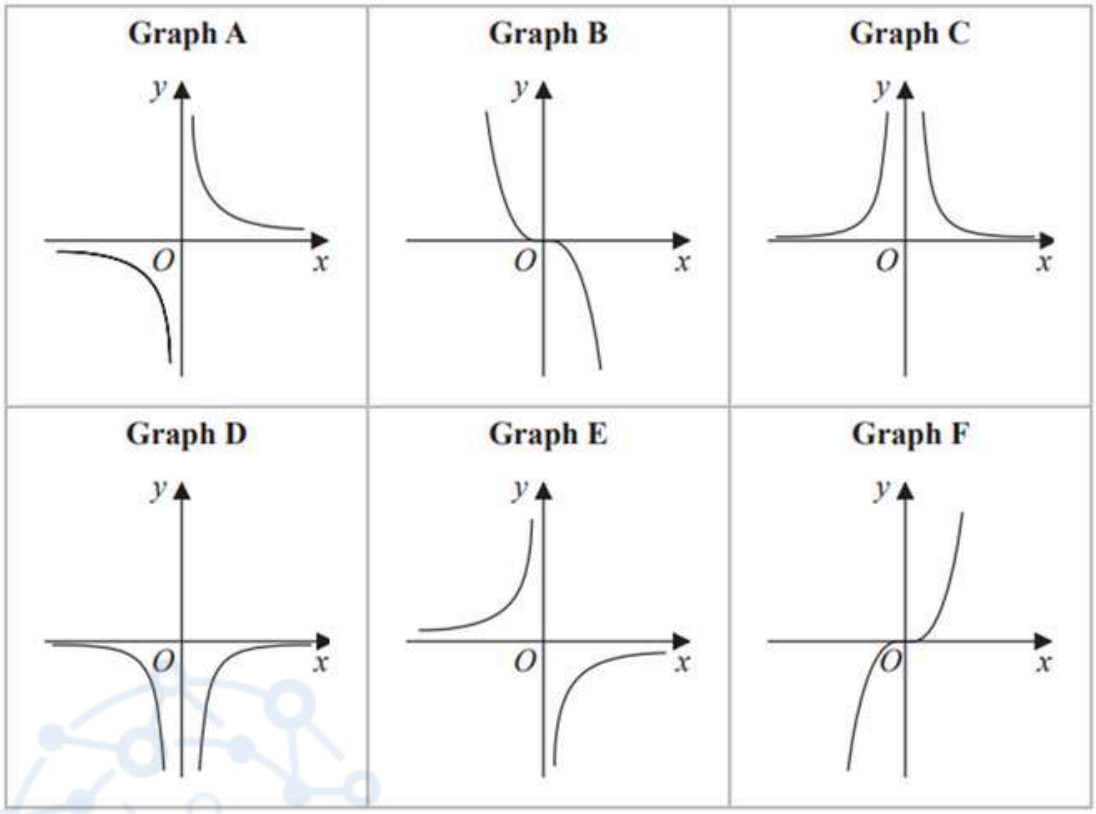
$x =$.....

(2)

(Total for Question 18 is 6 marks)

20. Jan 2020 2H/Q15

Here are six graphs.



Complete the table below with the letter of the graph that could represent each given equation.

Write your answers on the dotted lines.

Equation	Graph
$y = \frac{2}{x^2}$	.....
$y = -\frac{1}{2}x^3$	.....
$y = -\frac{5}{x}$	.....

(Total for Question 15 is 3 marks)

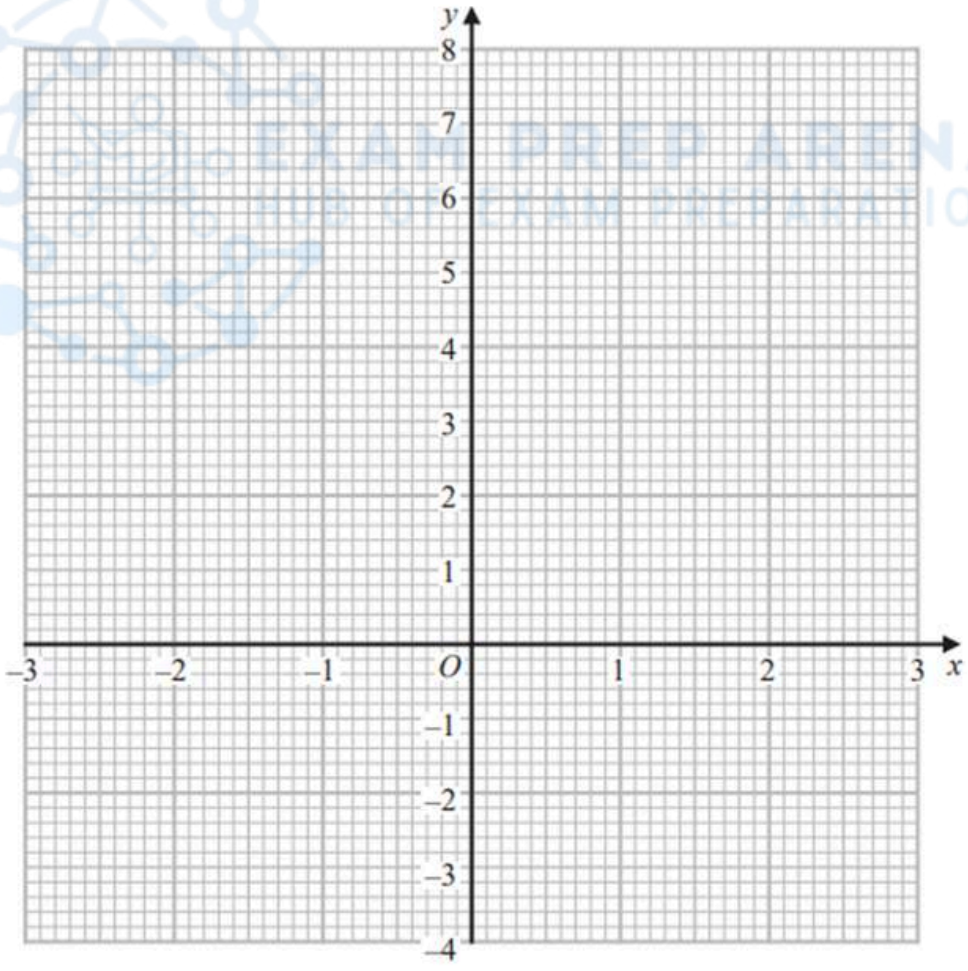
21. Jan 2020 2HR/Q15

(a) Complete the table of values for $y = x^2 - \frac{x}{2} - 3$

x	–3	–2	–1	0	1	2	3
y	7.5				–2.5		4.5

(2)

(b) On the grid, draw the graph of $y = x^2 - \frac{x}{2} - 3$ for values of x from –3 to 3



(2)

(Total for Question 15 is 4 marks)

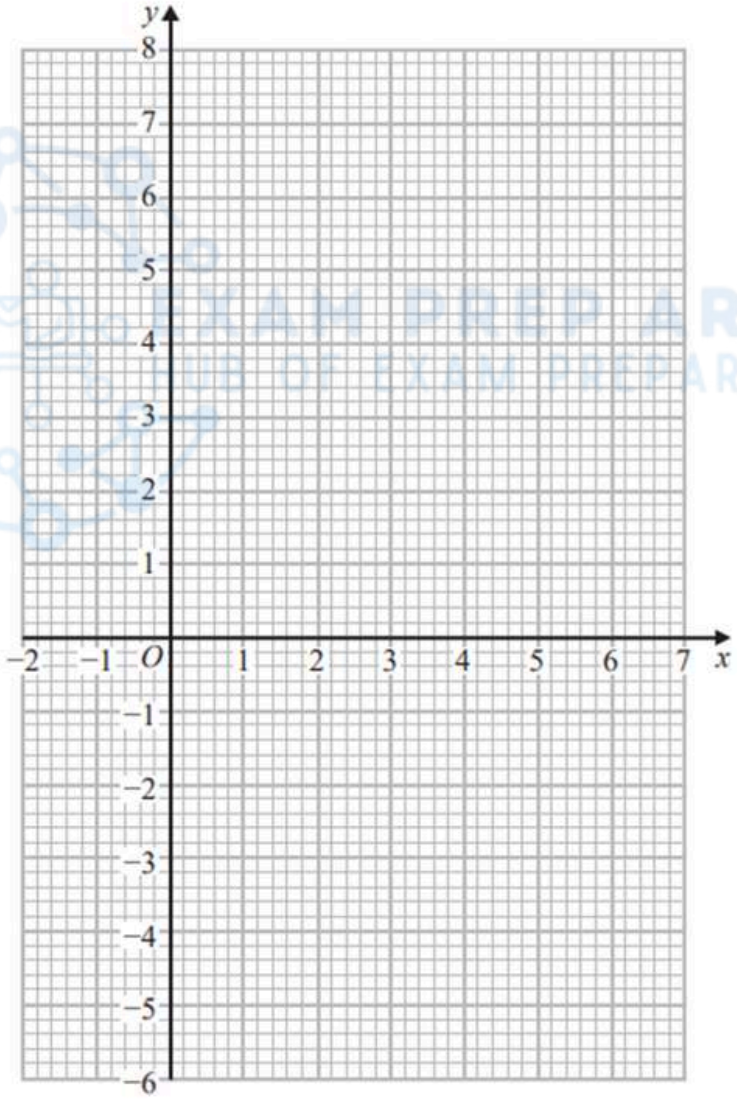
22. June 2019 2HR/Q3

(a) Complete the table of values for $y = 1 + 5x - x^2$

x	−1	0	1	2	3	4	5	6
y		1		7	7		1	

(2)

(b) On the grid, draw the graph of $y = 1 + 5x - x^2$ for values of x from −1 to 6



(2)

(Total for Question 3 is 4 marks)

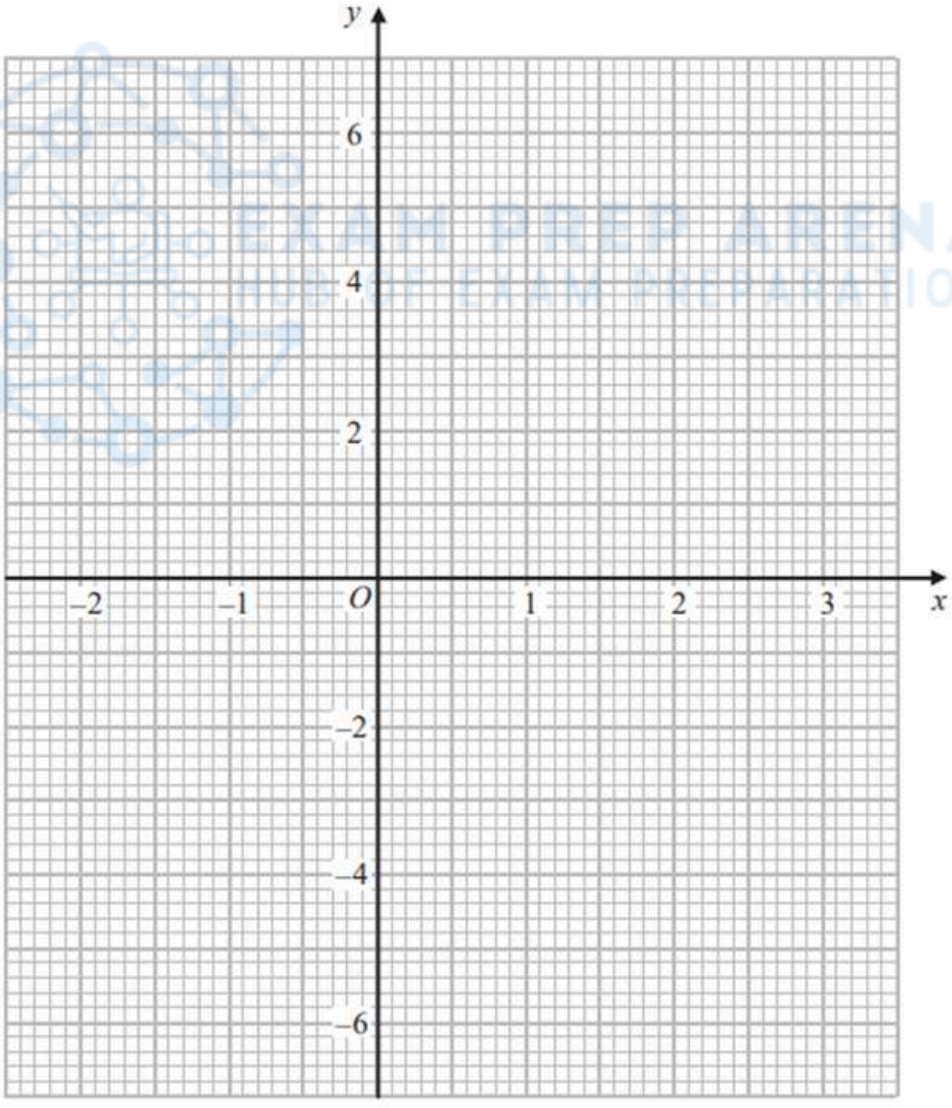
23. June 2018 2H/Q14

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

x	–2	–1	–0.5	0	1	1.5	2	3
y			4.875	4		–1.625		

(2)

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



(2)

(c) By drawing a suitable straight line on the grid,
find estimates for the solutions of the equation $x^3 - 2x^2 - x + 1 = 0$
Give your solutions correct to 1 decimal place.

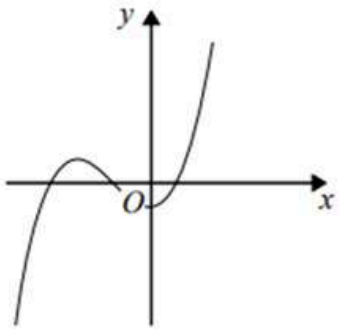
.....

(4)

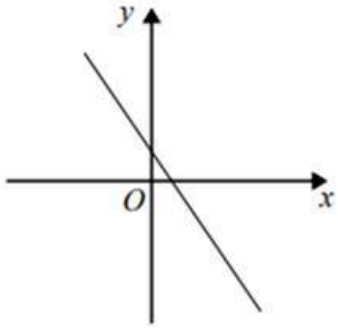
(Total for Question 14 is 8 marks)

24. Sample 2018 2H/Q19

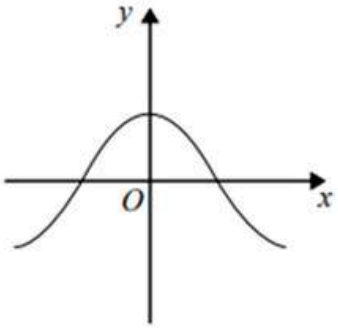
Here are nine graphs.



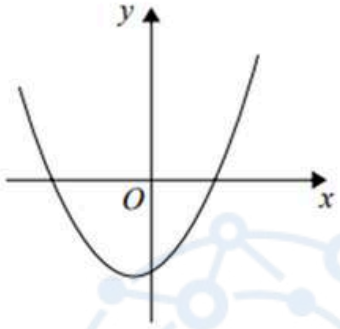
Graph A



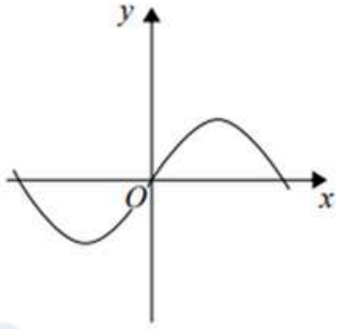
Graph B



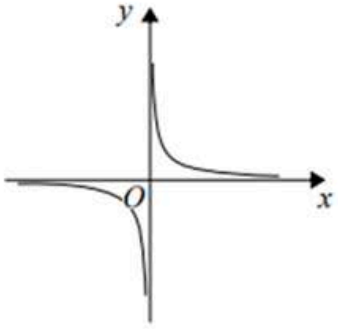
Graph C



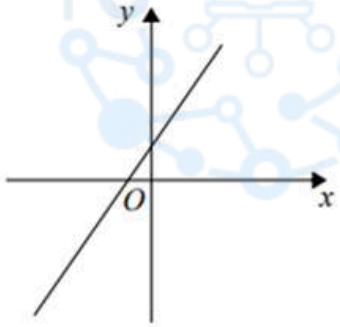
Graph D



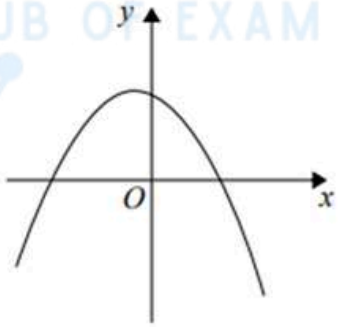
Graph E



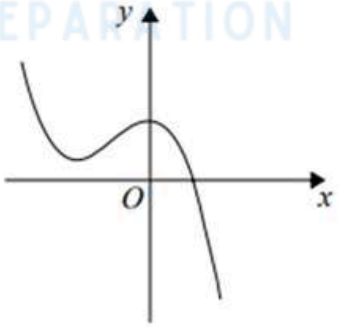
Graph F



Graph G



Graph H



Graph I

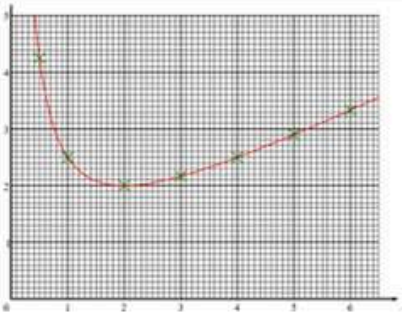
Complete the table below with the letter of the graph that could represent each given equation.

Equation	Graph
$y = \sin x$	
$y = 2 - 3x$	
$y = x^2 + x - 6$	
$y = x^3 + 3x^2 - 2$	

(Total for Question 19 is 3 marks)

MARKING SCHEME

1. Nov 2025 2H/Q12

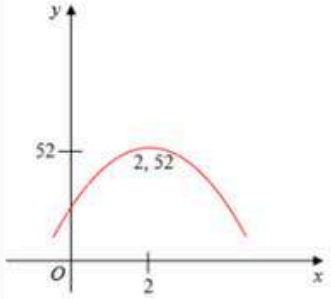
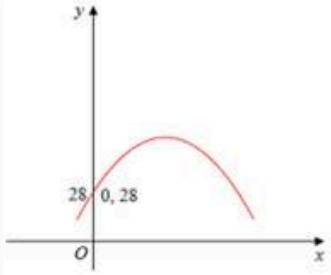
12	(a)	$\begin{array}{\|c\|c\|}\hline 1 & 2 \\ \hline 2.5 & 2 \\ \hline \end{array}$	2.5 and 2	1	B1 oe eg $\frac{5}{2}$
	(b)			2	M1 ft their table for at least 6 points plotted correctly (tolerance within or on the circles on the overlay)
		 *Correct answer scores full marks (unless from obvious incorrect working)*	Correct graph		A1 for a fully correct graph – points plotted correctly (within or on the circles on the overlay) and intention to join with a smooth curve (be generous if intention is clearly a smooth curve through all points) Ignore curve drawn for $x < 0.5$ and $x > 6$ Note: If a fully correct graph is shown, but an incomplete table is shown in (a), then award the mark for (a)
	(c)			2	M1 ft for a line drawn at $y = 3$ **or** an indication on the curve at $y = 3$ eg dot or cross etc **or** $\frac{1}{2}\left(x+\frac{4}{x}\right)=3$ stated **or** $y = 3$ stated
		Working required	0.8 and 5.2		A1ft dep on previous M1 for 0.7 – 0.8 **and** 5.1 – 5.3 **or** ft graph with 2 points of intersection with $y = 3$
					Total 5 marks

2. June 2025 2H/Q14

Question	Working	Answer	Mark	Notes
14 (a)		B	1	B1 cao
(b)		C	1	B1 cao
				Total 2 marks

3. June 2025 2H/Q25

Question	Working	Answer	Mark	Notes
25 (a)	$\pm6\left(x\pm\frac{4}{2}\right)^2$ ..... or $\pm6(x\pm2)^2$ ..... **or** $\pm6\left[(x\pm2)^2 .....\right]$ or $\pm6\left[\left(x\pm\frac{4}{2}\right)^2 .....\right]$ **or** $\pm6\left(x\pm\frac{24}{2\times-6}\right)^2$		3	M1 for a start to completing the square **or** correct substitution into $a\left(x+\frac{b}{2a}\right)^2+....$ from the formula $a\left(x+\frac{b}{2a}\right)^2-\frac{(b)^2}{4a}+c$
	$-6\left[\left(x-\frac{4}{2}\right)^2-\left(\frac{4}{2}\right)^2\right]$ ..... or $-6\left[(x-2)^2-2^2\right]$ ..... **or** $-6\left[\left(x-\frac{4}{2}\right)^2-\left(\frac{4}{2}\right)^2 .....\right]$ or $-6\left[(x-2)^2-2^2 .....\right]$ **or** $-6\left(x+\frac{24}{2\times-6}\right)^2-\frac{24^2}{4\times-6}$			M1 for correctly completing the square but terms do not need to be simplified and 28 may or may not be present or correct simplification of the first two parts of $a\left(x+\frac{b}{2a}\right)^2-\frac{(b)^2}{4a}(+c)$ **NB: Please refer to ALT mark scheme after (b) for comparison of coefficients method**
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	$52-6(x-2)^2$		A1 oe eg $-6(x-2)^2+52$
25(a) **ALT**	$-bx^2+2bcx-bc^2+a$ **and** $b = 6$ or $b = -6$		3	M1 for multiplying out $a-b(x-c)^2$ **and** $b = 6$ or $b = -6$
	$2bc = 24$ or $-bc^2+a = 28$			M1 for equating coefficients
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	$52-6(x-2)^2$		A1 oe eg $-6(x-2)^2+52$

(b)		'∩' or 'U' shaped symmetrical quadratic curve	3	B1	for drawing a '∩' or 'U' shaped symmetrical quadratic curve with the turning point in any quadrant
		Turning point marked as (2, 52)		B1	for drawing a '∩' shaped symmetrical quadratic curve in the correct quadrant with a turning point at (2, 52)
		Intersection with y-axis marked as (0, 28) or crossing at 28 marked		B1	for drawing a '∩' shaped symmetrical quadratic curve in the correct quadrant with an intersection on the y-axis marked as (0, 28) or marked as 28 on the y-axis
					Total 6 marks

4. June 2025 2HR/Q25

25		$a = 3$ $b = 45$ $c = 1$ **OR** $a = -3$ $b = 225$ $c = 1$	3	B1 B1 B1 Allow correct alternative angles for the value of b, eg 45 or –315, 225 or –135	for $a = 3$ **or** $a = -3$ for $a > 0$ and $b = 45$ **or** for $a < 0$ and $b = 225$ if no answer for a is seen allow this mark for $b = 45$ for $c = 1$
					Total 3 marks

5. June 2024 2H/Q25

25	(i)		(30, 2)	1	B1	cao
	(ii)		(300, 0)	1	B1	cao
						Total 2 marks

6. June 2024 2HR/Q16

16	(i)		**E**	1	B1
	(ii)		**A**	1	B1
					Total 2 marks

7. Nov 2023 2H/Q14

Question	Working	Answer	Mark	Notes	
14	For drawing the line $y - x - 2 = 0$ ($y = x + 2$) Goes through (–2, 0) (–1, 1) (0, 2) (1, 3) (2, 4) etc		3	M1	At least long enough for the intercept with the other line and to clearly see that it is the correct line
	This question is testing use of graphs to solve simultaneous equations H2.6B Therefore please ignore any algebraic methods to solve the equations.	$x = -1$ $y = 1$		A2	for both values correct, dep on M1 (A1 dep on M1 for one correct value or both values the wrong way round,) [if more than one line is drawn, one of which is correct, and the correct coordinates given, please given credit]
					Total 3 marks

8. June 2023 2H/Q18

4 (a)	x	−3	−2	−1	0	1	2	3	2	B2 for all correct values, otherwise B1 for 3 or 4 correct values
	y	**8**	2	**−2**	**−4**	−4	**−2**	**2**		
(b)									2	M1 dep on B1 scored in (a) for at least 5 points plotted correctly (ft their table)
					correct curve					A1 for a fully correct curve (all coordinates correct and correctly plotted and joined with a curve and curved between (0, –4) and (1, –4))
										Total 4 marks

9. June 2023 2H/Q18

18		**C**	3	B1 check diagrams
		F		B1 check diagrams
		A		B1 check diagrams
				Total 3 marks

10. June 2023 2HR/Q12

12	(a)		D	1	B1 allow d
	(b)		C	1	B1 allow c
	(c)		B	1	B1 allow b
					Total 3 marks

11. June 2023 2HR/Q26

26	(a)	23 (i)		(180, 0)	1	B1	
		(ii)		(360, −1)	1	B1	
	(b)					**Total 2 marks**	
	(c)				1	B1 cao	
							Total 3 marks

12. Jan 2023 2H/Q11

Question	Working	Answer	Mark	Notes
11		**B**	3	B1
		A		B1
		F		B1
				Total 3 marks

13. Jan 2023 2H/Q24

Q	Working	Answer	Mark	Notes
24		3	2	B1
		0.5		B1 oe
				Total 2 marks

14. June 2022 2H/Q23

23	(i)		(180, 0)	1	B1
	(ii)		(360, −1)	1	B1
					Total 2 marks

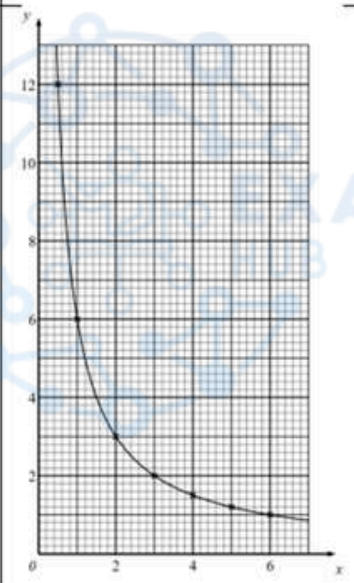
15. June 2022 2HR/Q16

16		C, F, D, H	3	B3 for all 4 correct (B2 for 2 or 3 correct) (B1 for 1 correct)
				Total 3 marks

16. Jan 2022 2H/Q21

21 (a)		–0.2 and 2.2	2	B2	Both correct to 1 decimal place (B1 for (–0.2, 0), (2.2, 0) **or** a single correct value to 1 decimal place **or** both values within –0.2 to –0.23 and 2.2 to 2.23)
(b)	$(y =) -2x + 1$ oe seen		3	M1	Written – could be label on graph
	$y = -2x + 1$ drawn			M1	dep on previous M1 for drawing $y = -2x + 1$ passing through (–1, 3) and (2, –3) (allow 1 square tolerance)
		–0.6 and 1.6		A1	dep on M2 for both answers to 1 decimal place
					Total 5 marks

17. Jan 2022 2HR/Q11

11 (a)	x: 0.5, 1, 2, 3, 4, 5, 6 y: **12**, 6, **3**, 2, **1.5**, **1.2**, 1	Correct table	2	B2 for all 4 correct values oe (ie $\frac{6}{5}$ or $\frac{3}{2}$) (B1 for 2 or 3 correct values)
(b)		Correct graph 7 points joined by a smooth curve.	2	M1ft (dep B1 in (a)) for 6 or 7 points plotted correctly using their values (within the circles on overlay). May be implied by curve passing through correct point. A1ft only allow one incorrect value from the table in (a), and for a curve that is decreasing throughout for $x = 0.5$ to $x = 6$. Ignore graph to the right of (6, 1) and to the left of (0.5, 12)
				Total 4 marks

18. May 2021 2H/Q15

Question	Working	Answer	Mark	Notes
15 (a)		8.5, 5, 4, 5	2	B2 all 4 correct (allow eg 5.0 for 5) (B1 for 2 or 3 correct)
(b)				M1 ft their table dep on B1 scored in (a) for 5 or 6 points plotted correctly (tolerance 1 small square)
		fully correct graph	2	A1 A fully correct graph – correct points plotted correctly (within tolerance of 1 small square) and intention to join with a smooth curve (be generous if intention is clearly a smooth curve through all points)
				NB: If a student has nothing in the table for part (a) but draws a fully correct graph in part (b) award the marks in part (a)
				Total 4 marks

19. Nov 2020 2HR/Q18

18 (a)		(−4.5) 3 4.5 (3) 1.5 (3) 10.5	2	B2 (B1	for all correct for any two correct) No points in table but correctly plotted on grid, award mark
(b)	(−3, −4.5) (−2,3) (−1,4.5) (0,3) (1,1.5) (2,3) (3,10.5)	Smooth curve	2	B2 (B1	for a correct smooth curve. Points or curve passing through correct values within half a small square. for at least 5 points plotted correctly; ft from table for plotting only provided B1 awarded in part (a))
(c)			2	M1	for drawing $y = -x - 1$ with two correct points plotted and intersection with curve. **or** for stating $y = -x - 1$ **or** for $\frac{1}{2}x^3 - 2x + 3 = -x - 1$ seen
		−2.3 to −2.4		A1	ft their curve dep on M1 **and** line $y = -x - 1$ drawn
					Total 6 marks

20. Jan 2020 2H/Q15

15		C, B, E	3	B3 (B2 (B1	for all 3 correct for 2 correct) for 1 correct)
					Total 3 marks

21. Jan 2020 2HR/Q15

15 (a)		2, −1.5, −3, 0	2	B2	B1 for 2 or 3 values correct
(b)			2	M1ft	At least 5 points plotted correctly ft from table dep on B1 in part (a)
				A1	For correct smooth curve.
					Total 4 marks

22. June 2019 2HR/Q3

Question		Working	Answer	Mark	Notes	
3	(a)		-5, 5, 5, -5	2	B2	All 4 correct values If not B2 then B1 for 2 or 3 correct values
	(b)		Fully correct curve	2	M1 A1	Plotting at least 6 points correctly from their table dep on B1 in part(a) Do not accept horizontal line at top of curve or straight line segments
						Total 4 marks

23. June 2018 2H/Q14

Question	Working	Answer	Mark	Notes
14 (a)		-6, 4, 0, -2, 4	2	B2 Award B1 for 2, 3 or 4 correct.
(b)		correct curve	2	B2 For correct smooth curve. If B2 not awarded, award B1 for at least 5 points plotted correctly ft from table dep on B1 or B2 in (a) (plots ±1 sq)
(c)	$x^3 - 2x^2 - 3x + 4 = -2x + 3$		4	M1
	Plot $y = -2x + 3$			M1 Sufficient to cross curve at least once.
	-0.8 or 0.6 or 2.2			A1 Any one correct x value at intersection of graphs (or one or more points given as coordinates) ft dep on second M1 (Award even if curve in (a) is incorrect)
		−0.8 0.6 2.2		A1 Accept −0.9 to −0.7 Accept 0.4 to 0.7 Accept 2.1 to 2.4 (not coordinates) ft (±1 square) dep on second M1 must be 3 values SC B2 for all correct solutions from graph of $y = x^3 - 2x^2 - x + 1$
				Total 8 marks

24. Sample 2018 2H/Q19

Question	Working	Answer	Mark	AO	Notes
19		E, B, D, A	3	AO1	B3 All correct B2 for 3 correct B1 for 2 correct