

Curved Graphs and Iteration

ANSWERS

Calculator | 30 minutes | Total marks: 26

Name

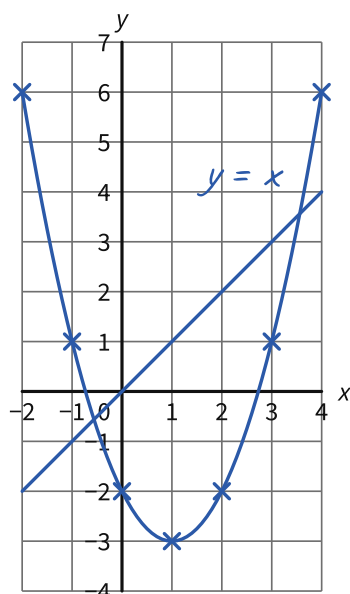
Class

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

x	-2	-1	0	1	2	3	4
y	6	1	-2	-3	-2	1	6 (1)(1)

[2 marks]

- (b) Use your table to draw the graph.



On the grid, draw the graph of $y = x^2 - 2x - 2$ for values of x from -2 to 4

Points plotted (1) Smooth curve through them (1)

[2 marks]

- (c) Use your graph to estimate the solutions of $x^2 - 2x - 2 = 0$

$x = -0.7$ and 2.7 (1)(1) accept ± 0.1

[2 marks]

- (d) By drawing the line $y = x$ on the grid, estimate the solutions of $x^2 - 3x - 2 = 0$

line $y = x$ drawn (1)

$x = -0.6$ and 3.6 (1)(1) accept ± 0.1

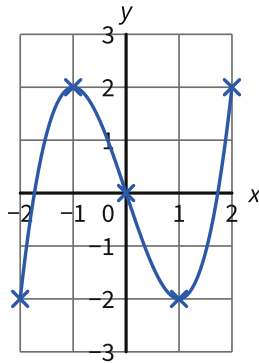
[3 marks]

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

x	-2	-1	0	1	2
y	-2	2	0	-2	2 (1)(1)

[2 marks]

- (b) Use your table to draw the graph.

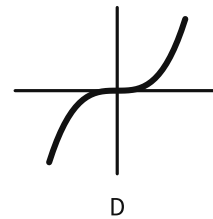
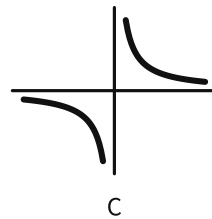
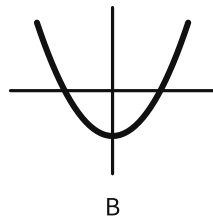
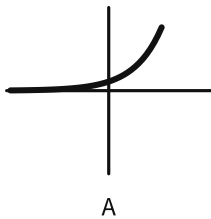


On the grid, draw the graph of $y = x^3 - 3x$ for values of x from -2 to 2

Points plotted (1) Smooth curve through them (1)

[2 marks]

- 3 Here are four sketch graphs.



Write the letter of the graph next to each equation.

$y = x^2 - 3$ B $y = x^3$ D $y = \frac{1}{x}$ C $y = 2^x$ A

All four correct scores 3 marks. Two or three correct scores 2 marks. One correct scores 1 mark.

[3 marks]

4 $y = \frac{4}{x}$

- (a) Work out the value of y when $x = 8$

$y =$ 0.5 (1) [1 mark]

- (b) Explain why the graph of $y = \frac{4}{x}$ never touches the x -axis.

4 divided by a number is never 0 (1)

[1 mark]

5

(a) $y = 3 \times 2^x$

Work out the value of y when $x = 4$

$y = 48$ (1)

[1 mark]

(b) The graph of $y = ka^x$ passes through the points (0, 5) and (2, 45). a is positive.

Work out the values of k and a .

$k = 5$ (1)

$5a^2 = 45$, so $a^2 = 9$ (1)

$k = 5$

$a = 3$ (1)

[3 marks]

6

(a) Show that $x^3 - 2x - 5 = 0$ can be rearranged to give $x = \sqrt[3]{2x + 5}$

$x^3 = 2x + 5$, then cube root both sides (1)

[1 mark]

(b) Use the iteration $x_{n+1} = \sqrt[3]{2x_n + 5}$ with $x_0 = 2$ to work out x_1 , x_2 and x_3 .

Give each answer to 3 decimal places.

$x_1 = 2.080$ (1)

$x_2 = 2.092$ (1)

$x_3 = 2.094$ (1)

[3 marks]

Question	Topic	RAG
1	I can draw a quadratic graph and use it to solve equations	
2	I can draw a cubic graph	
3	I can match graphs to their equations	
4	I understand reciprocal graphs	
5	I can work with exponential graphs	
6	I can use iteration to solve an equation	