

2.4 Answers

GCSE Mathematics Methods of Solving Equations

2.4.1 Solution to 2.1 An Advanced Initiative Test

$$\left. \begin{array}{l} 2x = y + 5 \\ 3x = 2y + 6 \end{array} \right\} \Rightarrow \begin{array}{l} 4x = 2y + 10 \\ 3x = 2y + 6 \end{array}$$

$$x = 4$$

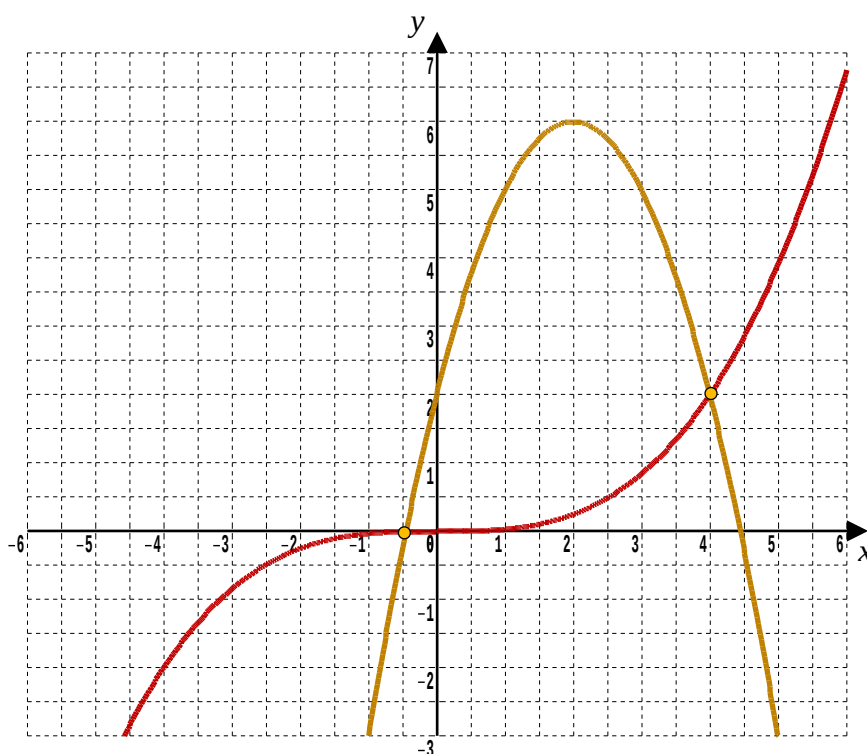
$$2 \times 4 = y + 5$$

$$8 = y + 5$$

$$y = 3$$

[6 marks]

2.4.2 Solution to 2.2 Graphical Simultaneous Equations



- (i) From looking at the graph, one solution is at (4, 2) and another solution at (- 0.5, 0)

[4 marks]

- (ii) Disadvantages

- The answers may only be approximately correct.
(4, 2) is exact, the other more accurately is at (- 0.45007, 0.00285)
- There may be other points of intersection “off the graph”
In this example there is another at about (- 35.5, - 1400)

[4 marks]

2.4.3 Solutions to 2.3 Exercise

Answer 1

$$\left. \begin{array}{l} 5x = 2y + 4 \\ 2x = y + 1 \end{array} \right\} \Rightarrow \begin{array}{l} 5x = 2y + 4 \\ 4x = 2y + 2 \end{array}$$

$$x = 2$$

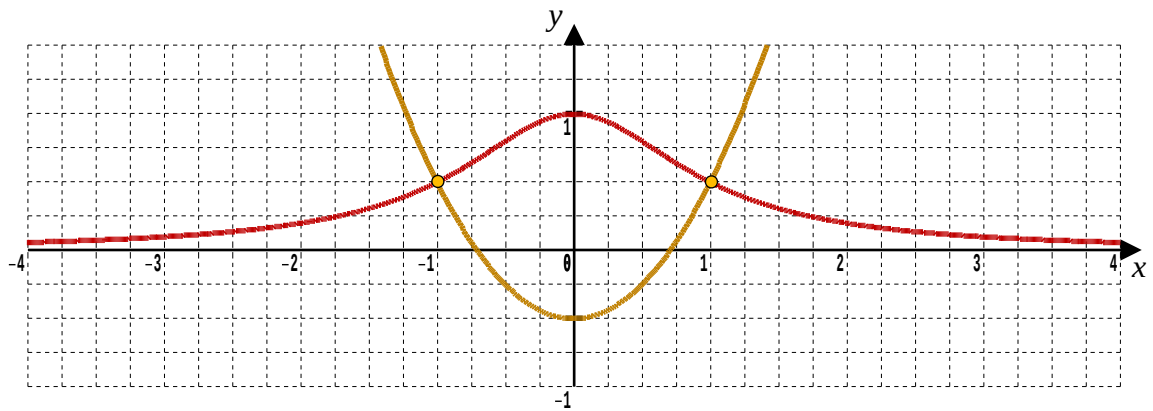
$$2 \times 2 = y + 1$$

$$4 = y + 1$$

$$y = 3$$

[6 marks]

Answer 2



There is one solutions at $\left(-1, \frac{1}{2}\right)$, and another solution at $\left(1, \frac{1}{2}\right)$

[4 marks]

Answer 3

$$\left. \begin{array}{l} 4x + 1 = y \\ 6x + 3 = 2y \end{array} \right\} \Rightarrow \begin{array}{l} 8x + 2 = 2y \\ 6x + 3 = 2y \end{array}$$

$$2x - 1 = 0$$

$$2x = 1$$

$$x = \frac{1}{2}$$

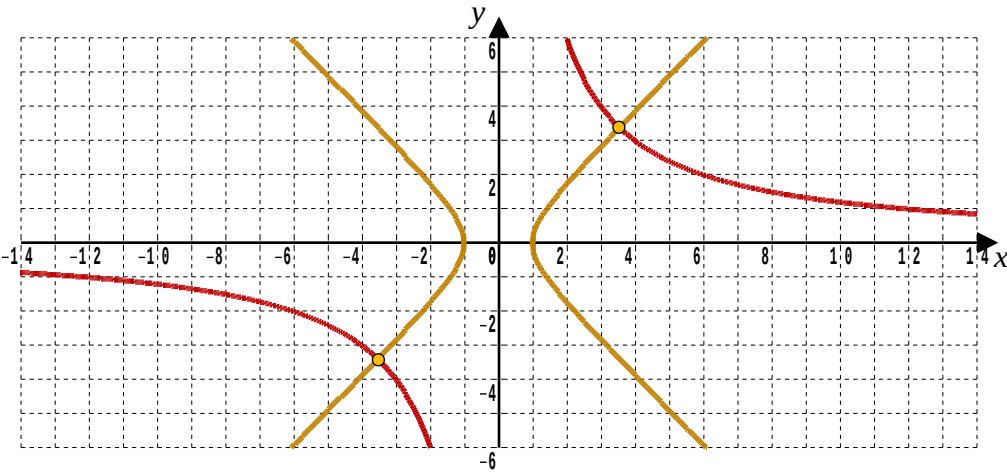
$$4 \times \frac{1}{2} + 1 = y$$

$$2 + 1 = y$$

$$y = 3$$

[6 marks]

Answer 4



There is one solutions at about $(-3.4, -3.5)$, and another at around $(3.4, 3.5)$

[4 marks]

Answer 5

$$\left. \begin{array}{l} x + y = 15 \\ x = 8 + y \end{array} \right\} \Rightarrow \begin{array}{l} x + y = 15 \\ x - y = 8 \end{array}$$

$$2x = 23$$
$$x = \frac{23}{2} \text{ or } 11.5$$
$$11.5 + y = 15$$
$$y = 15 - 11.5$$
$$y = 3.5$$

[6 marks]

Answer 6

(i)

$x^3 + 3x + 1$	x	$4x^2 + 1$
1	0	1
5	1	5
15	2	17
37	3	37
77	4	65

[4 marks]

(ii) $x = 0$ is one solution and $x = 3$ is another.

[2 marks]

(iii) $(0, 1), (3, 37)$

[2 marks]

Answer 7

(i)



From the graph, x is about 2.3

[2 marks]

(ii)

$y = \frac{24}{x^2 - 1}$	x	$y = x^2$
5.594	2.30	5.290
5.535	2.31	5.336
5.476	2.32	5.382
5.412	2.33	5.429
5.362	2.34	5.476
5.307	2.35	5.523
5.252	2.36	5.570

[4 marks]

(iii) $x = 2.33$

[4 marks]

Answer 8

$$\left. \begin{array}{l} y = 6x + 3 \\ 2y = 3x + 9 \end{array} \right\} \Rightarrow \begin{array}{l} 2y = 12x + 6 \\ 2y = 3x + 9 \end{array}$$

$$0 = 9x - 3$$

$$9x = 3$$

$$x = \frac{3}{9}$$

$$= \frac{1}{3}$$

$$y = 6 \times \frac{1}{3} + 3$$

$$= 2 + 3$$

$$= 5$$

[6 marks]