

Simultaneous Equations

ANSWERS

Calculator | 30 minutes | Total marks: 28

Name

Class

1 Solve the simultaneous equations

$$3x + 2y = 19$$

$$5x - 2y = 13$$

$$8x = 32 \text{ (1)}$$

$$x = 4 \text{ (1)}$$

$$x = 4$$

$$y = 3.5 \text{ (1)} \quad [3 \text{ marks}]$$

2 Solve the simultaneous equations

$$4x + 3y = 5$$

$$3x - 2y = 8$$

$$8x + 6y = 10 \text{ and } 9x - 6y = 24 \text{ (1)}$$

$$17x = 34 \text{ (1)}$$

$$x = 2 \text{ (1)}$$

$$x = 2$$

$$y = -1 \text{ (1)} \quad [4 \text{ marks}]$$

3 3 adult tickets and 2 child tickets cost £41

2 adult tickets and 5 child tickets cost £42

Work out the cost of one adult ticket and the cost of one child ticket.

$$3a + 2c = 41 \text{ and } 2a + 5c = 42 \text{ (1)}$$

$$6a + 4c = 82 \text{ and } 6a + 15c = 126 \text{ (1)}$$

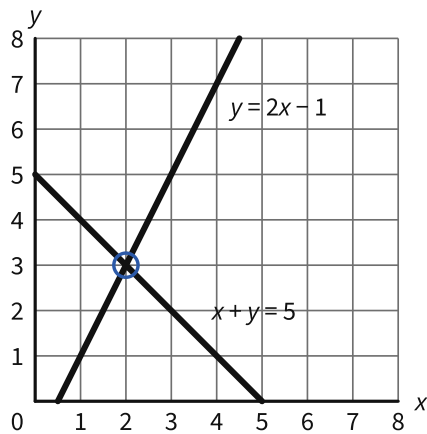
$$11c = 44 \text{ (1)}$$

$$\text{adult } \pounds 11$$

$$\text{child } \pounds 4 \text{ (1)} \quad [4 \text{ marks}]$$

4

The grid shows the graphs of $x + y = 5$ and $y = 2x - 1$



Use the graphs to solve the simultaneous equations

$$x + y = 5$$

$$y = 2x - 1$$

$$x = \underline{2 \text{ (1)}}$$

$$y = \underline{3 \text{ (1)}} \quad [2 \text{ marks}]$$

5

Solve the simultaneous equations

$$y = x^2$$

$$y = x + 6$$

$$x^2 = x + 6 \text{ (1)}$$

$$x^2 - x - 6 = 0 \text{ (1)}$$

$$(x - 3)(x + 2) = 0 \text{ (1)}$$

Answer $\underline{x = 3, y = 9 \text{ (1)} \text{ and } x = -2, y = 4 \text{ (1)}}$ [5 marks]

6

Solve the simultaneous equations

$$x^2 + y^2 = 25$$

$$y = x + 1$$

$$x^2 + (x + 1)^2 = 25 \text{ (1)}$$

$$2x^2 + 2x - 24 = 0 \text{ (1)}$$

$$(x + 4)(x - 3) = 0 \text{ (1)}$$

Answer $\underline{x = 3, y = 4 \text{ (1)} \text{ and } x = -4, y = -3 \text{ (1)}}$ [5 marks]

7

(a) Write down the equation of the circle with centre (0, 0) and radius 6

Answer $\underline{x^2 + y^2 = 36 \text{ (1)}}$ [1 mark]

(b) Write down the radius of the circle $x^2 + y^2 = 49$

Answer $\underline{7 \text{ (1)}}$ [1 mark]

8

Show that the line $y = 2x - 1$ meets the curve $y = x^2$ at only one point.

$$x^2 = 2x - 1 \quad (1)$$

$$x^2 - 2x + 1 = 0, \text{ so } (x - 1)^2 = 0 \quad (1)$$

only one solution, $x = 1 \quad (1)$

[3 marks]

Question	Topic	RAG
1	I can solve simultaneous equations by elimination	
2	I can solve simultaneous equations where both need multiplying	
3	I can set up and solve simultaneous equations	
4	I can solve simultaneous equations from a graph	
5	I can solve a linear and a quadratic equation together	
6	I can solve a line and a circle together	
7	I know the equation of a circle centred on the origin	
8	I can show that a line meets a curve once	