

A-Level Starter Activity



Topic: Solving Linear Simultaneous Equations

Chapter Reference: Pure 1, Chapter 3

8
minutes

1. Solve the following simultaneous equations,

$$2y = x + 6$$

$$y = 2x - 3$$

(3)

2. Solve the following simultaneous equations,

$$3x - 2y = 9$$

$$x + 4y = 10$$

(3)

3. Solve the following simultaneous equations,

$$5x + 4y = 3$$

$$x - 2y = 2$$

(3)

Solutions

1.

$2y = x + 6$ $y = 2x - 3$	M1
$2(2x - 3) = x + 6$ $4x - 6 = x + 6$ $3x = 12$ $x = 4$	M1
$y = 2(4) - 3$ $y = 5$	M1

2.

$3x - 2y = 9$ $x + 4y = 10$	M1
$x = 10 - 4y$ $3(10 - 4y) - 2y = 9$ $30 - 14y = 9$ $14y = 21$ $y = 1.5$	M1
$x + 4(1.5) = 10$ $x = 4$	M1

3.

$5x + 4y = 3$ $x - 2y = 2$	M1
$x = 2 + 2y$ $5(2 + 2y) + 4y = 3$ $10 + 10y + 4y = 3$ $14y = -7$ $y = -\frac{1}{2}$	M1
$x = 2y + 2$ $x = (2 \times -\frac{1}{2}) + 2$ $x = 1$	M1



Solutions

1a.

$3(x - 2) < 8 - 2x$ $3x - 6 < 8 - 2x$ $5x < 14$	M1
$x < \frac{14}{5}$	M1

1b.

$(2x - 7)(1 + x) < 0$ $x = \frac{7}{2}$	M1
$x = -1$	M1
$-1 < x < \frac{7}{2}$	

1c.

$-1 < x < \frac{14}{5}$	M1
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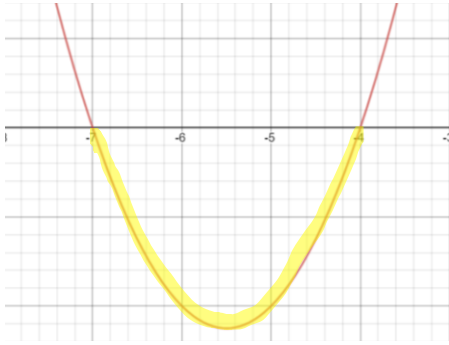
2.

$4 - 2x = 12 - x - x^2$ $x^2 - 2x - 8 = 0$ $(x - 4)(x + 2) = 0$	M1
$x = 4$ $y = 4 - 3(4) = -8$	M1
$x = -2$ $y = 4 - 3(-2) = 10$	M1

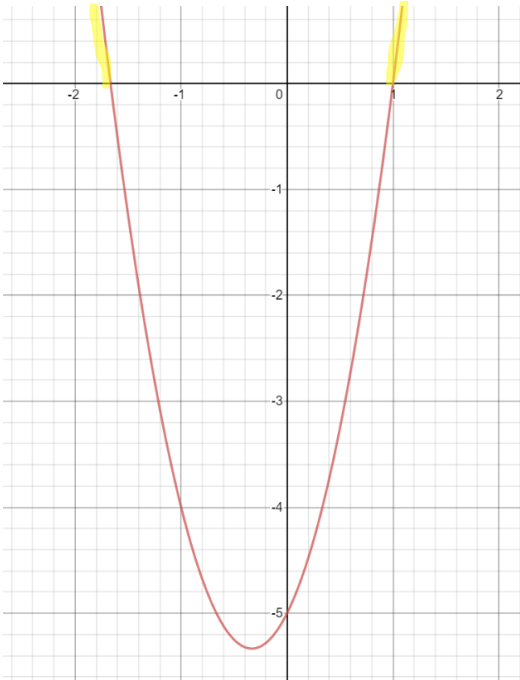


Solutions

1.

$x^2 + 11x + 28 \leq 0$ $(x + 7)(x + 4) = 0$	M1
$x = -7$ $x = -4$	M1
<div style="display: flex; justify-content: space-between;"><div style="width: 35%;"><p>Shape M1 Solutions are points below the x-axis M1 $-4 \leq x \leq -7$</p></div><div style="width: 60%; text-align: center;"></div></div>	

2.

$3x^2 + 2x - 5 = 0$ $(3x + 5)(x - 1) = 0$	M1
$x = -\frac{5}{3}$ $x = 1$	M1
<div style="display: flex; justify-content: space-between;"><div style="width: 35%;"><p>Shape M1 Solutions are points above the x-axis M1 $x > -\frac{5}{3}$ $x > 1$</p></div><div style="width: 60%; text-align: center;"></div></div>	

Solutions

1.

$y = 4 + 3x$ $x^2 + (4 + 3x)(4 + 3x) = 34$ $x^2 + 16 + 12x + 12x + 9x^2 = 34$ $10x^2 + 24x - 18 = 0$	M1
$5x^2 + 12x - 9 = 0$ $(x + 3)(5x - 3) = 0$	M1
$x = -3$ $x = \frac{3}{5}$	M1
When $x = -3$, $y = 4 + 3(-3)$ $y = -5$	M1
When $x = \frac{3}{5}$, $y = 4 + 3(\frac{3}{5})$ $y = 5\frac{4}{5}$	M1

2.

$(3 + 2y)^2 + 2y^2 = 27$ $(3 + 2y)(3 + 2y) + 2y^2 = 27$ $9 + 4y^2 + 6y + 6y + 2y^2 = 27$	M1
$6y^2 + 12y - 18 = 0$ $y^2 + 2y - 3 = 0$	M1
$(y - 1)(y + 3) = 0$ $y = 1$ $y = -3$	M1
When $y = 1$, $x = 3 + 2(1)$ $x = 5$	M1
When $y = -3$, $x = 3 + 2(-3)$ $x = -3$	M1

