Solve where $y =$ and $y =$ (setting the equations equal to one another)

Maths

Mrs Dennett

Solve where $y =$ and $y =$

1. Solve these pairs of equations.

a) $y = x^2$

$y = 2x + 3$

b) $y = x^2 - 14$

$y = 10 - 5x$

2. Solve this pair of equations

$y = x^2 + 4x - 3$

$y = 4x$

3. Verify that $x = 2.62$ and $y = 6.85$ (correct to 2 decimal places) is a solution to both these equations.

$y = x^2$

$y = 3x - 1$

What is the other solution?

Solve where $y =$ and $y =$

4. Matt is solving the simultaneous equations.

$$y = x^2 + 4$$
$$y = 6x - 4$$

He equates the two expressions for y and starts to rearrange.

$$x^2 + 4 = 6x - 4$$

$$x^2 - 6x = 0$$

Where has Matt gone wrong?

Correct Matt's work and go on to solve the simultaneous equations.

Answers

Solve where $y =$ and $y =$

1. Solve these pairs of equations.

a) $y = x^2$

$y = 2x + 3$

$x = 3$ and $y = 9$ and $x = -1$ and $y = 1$

b) $y = x^2 - 14$

$y = 10 - 5x$

$x = 3$ and $y = -5$ and $x = -8$ and $y = 50$

2. Solve this pair of equations

$y = x^2 + 4x - 3$

$y = 4x$

$x = \sqrt{3}$ and $y = 4\sqrt{3}$ and $x = -\sqrt{3}$ and $y = -4\sqrt{3}$

3. Verify that $x = 2.62$ and $y = 6.85$ (correct to 2 decimal places) is a solution to both these equations, $y = x^2$ and $y = 3x - 1$

$y = x^2$ and $y = 3x - 1$

$x^2 - 3x + 1 = 0$

$$x = \frac{-(-3) \pm \sqrt{3^2 - 4 \times 1 \times 1}}{2 \times 1} = \frac{3 \pm \sqrt{5}}{2}$$

$$x = \frac{3 + \sqrt{5}}{2} = 2.618\ldots \text{ so } x = 2.62 \text{ to 2 d.p.}$$

$$y = \left(\frac{3 + \sqrt{5}}{2}\right)^2 = 6.854\ldots \text{ so } y = 6.85 \text{ to 2 d.p.}$$

What is the other solution?

$x = 0.38$ and $y = 0.15$

Solve where $y =$ and $y =$

4. Matt is solving the simultaneous equations.

$$y = x^2 + 4$$
$$y = 6x - 4$$

He equates the two expressions for y and starts to rearrange.

$$x^2 + 4 = 6x - 4$$

$$x^2 - 6x = 0$$

Where has Matt gone wrong?

$x^2 - 6x + 8 = 0$

Correct Matt's work and go on to solve the simultaneous equations.

$x = 4, y = 20$ and $x = 2, y = 8$