GCSE HIGHER · REVISION MAT 3

Simultaneous equations

1 Solve

$$a + b = 12$$
$$a - b = 2$$

2 Solve

$$2x + 3y = 12$$
$$2x + y = 8$$

3 Explain why these equations have no solution.

$$x + y = 5$$
$$2x + 2y = 7$$

4 Twice one number plus a second number is 31.

The first number is 2 more than the second.

Find both numbers.

5 Solve

$$5x + 2y = 4$$
$$3x - 4y = 18$$

6 A gym charges a joining fee plus a monthly fee.

3 months cost £105 in total.

7 months cost £185 in total.

Find the cost of 12 months.

7 Solve

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

8 The line $x + y = 5$ meets the circle $x^2 + y^2 = 13$ at two points.

Find their coordinates.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 3

Simultaneous equations

1 $2a = 14$

$a = 7, b = 5$

2 $2y = 4 \Rightarrow y = 2$

$x = 3, y = 2$

3 If $x + y = 5$ then $2x + 2y = 10$.

$10 \neq 7$, so no values work (the lines are parallel).

4 $2a + b = 31, a - b = 2$

$3a = 33$

$a = 11, b = 9$

5 $10x + 4y = 8$

$13x = 26 \Rightarrow x = 2$

$x = 2, y = -3$

6 $j + 3m = 105, j + 7m = 185$

$4m = 80 \Rightarrow m = 20, j = 45$

£45 + 12 × £20 = £285

7 $x^2 - 2x - 3 = 0$

$(x - 3)(x + 1) = 0$

(3, 6) and (–1, –2)

8 $x^2 + (5 - x)^2 = 13$

$2x^2 - 10x + 12 = 0$

$x^2 - 5x + 6 = 0 \Rightarrow x = 2$ or 3

(2, 3) and (3, 2)

Mr&Mrs MATHS