GCSE HIGHER · REVISION MAT 5

Simultaneous equations

1 Solve

$$3x + y = 13$$
$$x + y = 7$$

2 Solve

$$2x - 3y = -1$$
$$4x + 3y = 25$$

3 Show that (5, –2) is the solution of

$$x + 2y = 1$$
$$3x - y = 17$$

4 A farmer has hens and cows.

There are 30 heads and 84 legs.

How many cows are there?

5 Solve

$$3x + 2y = 4$$
$$4x + 5y = 17$$

6 The digits of a two-digit number add up to 11.

Reversing the digits increases the number by 27.

Find the number.

7 Find where the line $y = x + 4$ meets the curve

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

8 Show that the line $y = 2x + 5$ is a tangent to the circle

$$x^2 + y^2 = 5$$

Mr&Mrs MATHS

ANSWERS · REVISION MAT 5

Simultaneous equations

1 $2x = 6$

$x = 3$, $y = 4$

2 $6x = 24 \Rightarrow x = 4$

$x = 4$, $y = 3$

3 $5 - 4 = 1$ ✓

$15 + 2 = 17$ ✓

(5, –2) satisfies both.

4 $h + c = 30$

$2h + 4c = 84$

$2c = 24$

12 cows

5 $15x + 10y = 20$

$8x + 10y = 34$

$7x = -14$

$x = -2$, $y = 5$

6 $t + u = 11$

$(10u + t) - (10t + u) = 27$

$u - t = 3 \Rightarrow u = 7, t = 4$

47

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

$(x - 1)(x - 2) = 0$

(1, 5) and (2, 6)

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

$5x^2 + 20x + 20 = 0$

$(x + 2)^2 = 0$: one repeated root

Touches at (–2, 1) only, so it is a tangent.

Mr&Mrs MATHS