GCSE HIGHER · REVISION MAT 2

Solving quadratic equations

1 Solve

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

2 Solve

$$x^2 - 9x + 20 = 0$$

3 Kim solves $x^2 = 5x$ by dividing both sides by x.

She gets $x = 5$.

Explain what Kim has missed.

4 The product of two consecutive positive integers is 156.

Find the two integers.

5 Write $x^2 + 6x - 4$ in the form $(x + a)^2 + b$.

Hence solve $x^2 + 6x - 4 = 0$, leaving your answers as surds.

6 A square has sides of x cm.

A rectangle is 3 cm longer and 1 cm narrower than the square.

The rectangle's area is 21 cm^2.

Find the area of the square.

7 $x^2 + bx + 12 = 0$ has a solution $x = 3$.

Find b and the other solution.

8 A ball's height, h m, after t seconds is

$$h = 2 + 15t - 5t^2$$

Find when the ball hits the ground, to 2 decimal places.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 2

Solving quadratic equations

1 $x(x + 5) = 0$

$x = 0$ or $x = -5$

2 $(x - 4)(x - 5) = 0$

$x = 4$ or $x = 5$

3 Dividing by x loses the solution $x = 0$.

$x^2 - 5x = 0 \Rightarrow x(x - 5) = 0$

$x = 0$ or $x = 5$

4 $n(n + 1) = 156$

$n^2 + n - 156 = 0$

$(n + 13)(n - 12) = 0$

12 and 13

5 $(x + 3)^2 - 13$

$(x + 3)^2 = 13$

$x = -3 \pm \sqrt{13}$

6 $(x + 3)(x - 1) = 21$

$x^2 + 2x - 24 = 0$

$(x + 6)(x - 4) = 0 \Rightarrow x = 4$

Area of square = 16 cm²

7 $9 + 3b + 12 = 0 \Rightarrow b = -7$

$x^2 - 7x + 12 = (x - 3)(x - 4)$

$b = -7$, other solution $x = 4$

8 $5t^2 - 15t - 2 = 0$

$t = \dfrac{15 + \sqrt{265}}{10}$

$t = 3.13$ seconds

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