GCSE HIGHER · REVISION MAT 2

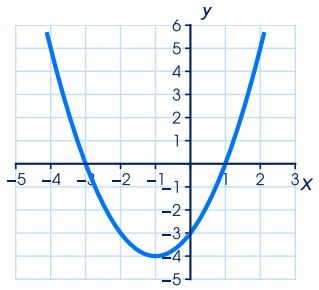
Completing the square and turning points

1 Find the roots of

$$y = x^2 - 9x + 14$$

2 Write $x^2 - 6x + 1$ in the form $(x - a)^2 - b$.

3 Write down the roots and the turning point of this curve.



4 A quadratic $y = x^2 + bx + c$ has roots -2 and 4.

Find the x-coordinate of its turning point.

Find b and c.

5 Explain why $y = (x + 1)^2 + 5$ has no real roots.

6 Find the minimum value of $x^2 + 4x + 10$ and the value of x where it occurs.

7 Show that

$$3x^2 - 12x + 5 = 3(x - 2)^2 - 7$$

8 Find the maximum point of the curve

$$y = -x^2 + 6x - 5$$

Mr&Mrs MATHS

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Completing the square and turning points

1 $(x - 2)(x - 7) = 0$

$x = 2$ and $x = 7$

2 **$(x - 3)^2 - 8$**

3 **Roots -3 and 1**

Turning point $(-1, -4)$

4 Midway between roots: $x = 1$

$(x + 2)(x - 4) = x^2 - 2x - 8$

$x = 1$; $b = -2$, $c = -8$

5 $(x + 1)^2 \geq 0$, so $y \geq 5$.

The curve never reaches $y = 0$.

6 $(x + 2)^2 + 6$

Minimum 6 when $x = -2$

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

$= 3x^2 - 12x + 12 - 7$

$= 3x^2 - 12x + 5$

8 $-(x^2 - 6x) - 5$

$= -[(x - 3)^2 - 9] - 5$

$= 4 - (x - 3)^2$

Maximum point $(3, 4)$

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