

# Quadratics - GCSE Revision

## Exercise A

$$\begin{aligned} (1) \quad & 2y^2 - 9y + 4 \\ & = 2y^2 - 8y - y + 4 \\ & = 2y(y-4) - 1(y-4) \\ & = \underline{\underline{(y-4)(2y-1)}} \end{aligned} \quad \left. \begin{array}{l} p = +8 \\ s = -9 \end{array} \right\} -8, -1$$

$$(2) \quad 2y^2 + 5y = y \underline{\underline{(2y+5)}}$$

$$(3) \quad 4x^2 - 25 = (2x-5)(2x+5)$$

## Exercise B

$$\begin{aligned} (1) \quad & \cancel{x^2 + 8x} + x^2 + 8x - 2 \\ & = (x+4)^2 - 16 - 2 \\ & = \underline{\underline{(x+4)^2 - 18}} \end{aligned}$$

$$(2) \quad x^2 - 6x = \underline{\underline{(x-3)^2 - 9}}$$

$$\begin{aligned} (3) \quad & 2x^2 - 12x - 2 = 2[x^2 - 6x - 1] \\ & = 2[(x-3)^2 - 9 - 1] \\ & = 2[(x-3)^2 - 10] \\ & = \underline{\underline{2(x-3)^2 - 20}} \end{aligned}$$

$$\begin{aligned} (4) \quad & 2x^2 + 9x - 3 = 2 \left[ x^2 + \frac{9}{2}x \right] - 3 \\ & = 2 \left[ \left( x + \frac{9}{4} \right)^2 - \frac{81}{16} \right] - 3 \\ & = 2 \left( x + \frac{9}{4} \right)^2 - \frac{81}{8} - 3 \\ & = 2 \left( x + \frac{9}{4} \right)^2 - \frac{105}{8} // \end{aligned}$$

### Exc

$$(1) \quad x^2 + 8x - 2 = 0$$
$$(x+4)^2 - 16 - 2 = 0$$
$$(x+4)^2 = 18$$
$$x+4 = \pm\sqrt{18}$$
$$\underline{\underline{x = -4 \pm 3\sqrt{2}}}$$

$$(2) \quad (2x^2 + 9x - 3) = 0$$

→ We completed the square in Ex B / Q4.

$$2\left(x + \frac{9}{4}\right)^2 - \frac{105}{8} = 0$$

$$2\left(x + \frac{9}{4}\right)^2 = \frac{105}{8}$$

$$\left(x + \frac{9}{4}\right)^2 = \frac{105}{16}$$

$$x + \frac{9}{4} = \frac{\pm\sqrt{105}}{4}$$

$$x = -\frac{9}{4} \pm \frac{\sqrt{105}}{4}$$

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### Ex D

- Exactly similar questions are there in the worksheet, "Quadratics" - Exercise D. The answers to that worksheet can be downloaded from the website. Please <sup>those questions</sup> try ~~them~~ and check the answers.

### Ex E

Q1 and Q2 are similar to those on the "Quadratic Inequalities" worksheet and the answers to those questions are on the website. I have done Q3 and Q4 here.

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(3)

$$x^2 < 16$$

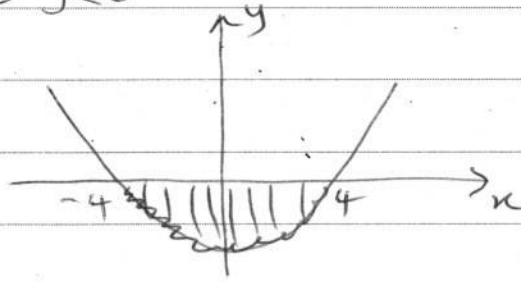
$$x^2 - 16 < 0 \rightarrow y < 0$$

$$y = x^2 - 16$$

$$x^2 - 16 = 0$$

$$x^2 = 16$$

$$x = \pm 4$$



$$\underline{\underline{-4 < x < 4}}$$

(4)

$$3x^2 \geq 75$$

$$x^2 \geq 25$$

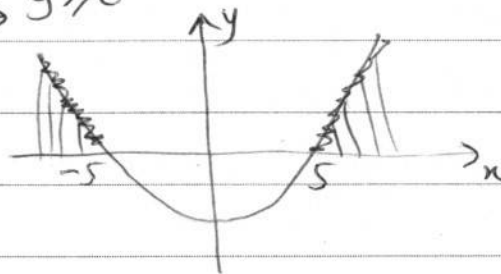
$$x^2 - 25 \geq 0 \rightarrow y \geq 0$$

$$y = x^2 - 25$$

$$x^2 - 25 = 0$$

$$x^2 = 25$$

$$x = \pm 5$$



$$\underline{\underline{x \leq -5 \quad \text{or} \quad x \geq 5}}$$