



**eClassroom**

GCSE Mathematics

# **Factorising**

**Questions**

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Pearson Edexcel GCSE & iGCSE Mathematics



## Section A — Foundation

### Worked Examples

#### [Fluency]

Factorise:  $6x + 9$

$$6x + 9 = 3(2x + 3)$$

#### [Reasoning]

Factorise:  $x^2 + 7x + 12$

Find two numbers that multiply to 12 and add to 7:  $3 \times 4 = 12$ ,  $3 + 4 = 7$

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

#### [Problem Solving]

Factorise:  $x^2 - x - 6$

Find two numbers that multiply to  $-6$  and add to  $-1$ :  $-3$  and  $2$

$$x^2 - x - 6 = (x - 3)(x + 2)$$

#### [Fluency]

1. Factorise:  $6x + 9$

(1 mark)

#### [Fluency]

2. Factorise:  $x^2 + 5x$

(1 mark)

#### [Fluency]

3. Factorise:  $x^2 + 7x + 12$

(2 marks)

#### [Fluency]

4. Factorise:  $x^2 - x - 6$

(2 marks)

#### [Fluency]

5. Factorise:  $x^2 - 9x + 18$

(2 marks)



**[Reasoning]****6.**Factorise:  $12x^2 - 8x$ 

Write down the highest common factor you used.

**(2 marks)****[Reasoning]****7.**Factorise:  $x^2 + 3x - 10$ Hence solve  $x^2 + 3x - 10 = 0$ .**(3 marks)****[Problem Solving]****8.**Factorise:  $2x^2 + 6x + 4$ 

Hint: first take out a common factor.

**(3 marks)****[Problem Solving]****9.**The area of a rectangle is  $x^2 + 8x + 15$  cm<sup>2</sup>.One side has length  $(x + 3)$  cm.

Find an expression for the other side.

**(3 marks)****[Problem Solving]****10.**Show that  $x^2 - 6x + 9 = (x - 3)^2$ .Hence write down the minimum value of  $x^2 - 6x + 9$ .**(3 marks)**



## Section B — Higher

### Worked Examples

#### [Fluency]

Factorise:  $x^2 - 25$  (Difference of Two Squares)

$$x^2 - 25 = (x - 5)(x + 5)$$

#### [Reasoning]

Factorise:  $2x^2 + 7x + 3$

$ac = 6$ . Find two numbers that multiply to 6 and add to 7: 1 and 6.

$$2x^2 + x + 6x + 3 = x(2x + 1) + 3(2x + 1) = \mathbf{(x + 3)(2x + 1)}$$

#### [Problem Solving]

Factorise:  $6x^2 + x - 2$

$ac = -12$ . Numbers: 4 and  $-3$ .

$$6x^2 + 4x - 3x - 2 = 2x(3x + 2) - 1(3x + 2) = \mathbf{(2x - 1)(3x + 2)}$$

#### [Fluency]

1. Factorise:  $x^2 - 25$

(1 mark)

#### [Fluency]

2. Factorise:  $4x^2 - 9$

(2 marks)

#### [Fluency]

3. Factorise:  $2x^2 + 7x + 3$

(3 marks)

#### [Fluency]

4. Factorise:  $3x^2 - 10x + 8$

(3 marks)

#### [Fluency]

5. Factorise:  $6x^2 + x - 2$

(3 marks)





[Reasoning]

6.

Factorise:  $x^3 + 2x^2 + 3x + 6$

Hint: use grouping.

(3 marks)

[Reasoning]

7.

Solve:  $2x^2 + 5x - 3 = 0$  by factorising.

(3 marks)

[Reasoning]

8.

Factorise fully:  $3x^2 - 75$

Hence solve  $3x^2 - 75 = 0$ .

(4 marks)

[Problem Solving]

9.

Simplify:

$$\frac{x^2 - 9}{x^2 + 5x + 6}$$

(4 marks)

[Problem Solving]

10.

Given that  $x^2 + bx + c = (x + p)(x + q)$ , write  $b$  and  $c$  in terms of  $p$  and  $q$ .

Hence show that if  $b$  and  $c$  are both positive,  $p$  and  $q$  must both be positive.

(4 marks)