



eClassroom

GCSE Mathematics

Factorising

Worked Solutions

Pearson Edexcel GCSE & iGCSE Mathematics



Section A — Foundation — Worked Solutions

[Fluency] Question 1

$$\text{HCF}=3$$

$$\therefore 3(2x+3)$$

[Fluency] Question 2

$$\text{HCF}=x$$

$$\therefore x(x+5)$$

[Fluency] Question 3

$$3 \times 4 = 12, 3 + 4 = 7$$

$$\therefore (x+3)(x+4)$$

[Fluency] Question 4

$$-3 \times 2 = -6, -3 + 2 = -1$$

$$\therefore (x-3)(x+2)$$

[Fluency] Question 5

$$-6 \times -3 = 18, -6 + (-3) = -9$$

$$\therefore (x-6)(x-3)$$

[Reasoning] Question 6

$$\text{HCF}=4x$$

$$\therefore 4x(3x-2); \text{HCF}=4x$$

[Reasoning] Question 7

$$x^2 + 3x - 10 = (x + 5)(x - 2)$$

$$x+5=0 \rightarrow x=-5 \text{ or } x-2=0 \rightarrow x=2$$

$$\therefore (x+5)(x-2); x=-5 \text{ or } x=2$$



**[Problem Solving] Question 8**

$$2x^2 + 6x + 4 = 2(x^2 + 3x + 2) = 2(x + 1)(x + 2)$$

$$\therefore \mathbf{2(x+1)(x+2)}$$

[Problem Solving] Question 9

$$x^2 + 8x + 15 = (x + 3)(x + 5)$$

Other side = (x+5)

$$\therefore \mathbf{(x+5) \text{ cm}}$$

[Problem Solving] Question 10

$$x^2 - 6x + 9 = (x - 3)^2 \checkmark$$

Since $(x-3)^2 \geq 0$ for all x , minimum = 0 when $x=3$

$$\therefore \mathbf{\text{Minimum} = 0 \text{ (when } x=3)}$$



Section B — Higher — Worked Solutions

[Fluency] Question 1

$$\text{DOTS: } a^2 - b^2 = (a - b)(a + b)$$

$$\therefore (x - 5)(x + 5)$$

[Fluency] Question 2

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

$$\therefore (2x - 3)(2x + 3)$$

[Fluency] Question 3

$$ac = 6, \text{ numbers } 1 \text{ and } 6: 2x^2 + x + 6x + 3 = x(2x + 1) + 3(2x + 1)$$

$$\therefore (x + 3)(2x + 1)$$

[Fluency] Question 4

$$ac = 24, \text{ numbers } -4 \text{ and } -6: 3x^2 - 4x - 6x + 8 = x(3x - 4) - 2(3x - 4)$$

$$\therefore (x - 2)(3x - 4)$$

[Fluency] Question 5

$$ac = -12, \text{ numbers } 4 \text{ and } -3: 6x^2 + 4x - 3x - 2 = 2x(3x + 2) - 1(3x + 2)$$

$$\therefore (2x - 1)(3x + 2)$$

[Reasoning] Question 6

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

$$\therefore (x + 2)(x^2 + 3)$$

[Reasoning] Question 7

$$2x^2 + 5x - 3 = (2x - 1)(x + 3)$$

$$x = 1/2 \text{ or } x = -3$$

$$\therefore x = 1/2 \text{ or } x = -3$$



**[Reasoning] Question 8**

$$3x^2 - 75 = 3(x^2 - 25) = 3(x - 5)(x + 5)$$

$$x=5 \text{ or } x=-5$$

$$\therefore 3(x-5)(x+5); x=\pm 5$$

[Problem Solving] Question 9

$$\frac{(x-3)(x+3)}{(x+2)(x+3)} = \frac{x-3}{x+2}$$

\therefore

[Problem Solving] Question 10

$$(x+p)(x+q) = x^2 + (p+q)x + pq, \text{ so } b=p+q \text{ and } c=pq$$

If $b > 0$: $p+q > 0$. If $c > 0$: $pq > 0 \rightarrow$ same sign.

If both negative: $p+q < 0 \rightarrow b < 0$, contradiction. So p, q both positive ✓

$$\therefore b=p+q, c=pq. b>0 \text{ and } c>0 \blacksquare p, q \text{ both positive } \checkmark$$

