FACTORISING QUADRATICS

STAGE TWO

Ref: G227.2S2

A1 Factorise: $x^2 + x - 20$	**A2** Factorise: $x^2 - 2x - 15$	**A3** Factorise: $x^2 + 3x - 4$	**A4** Factorise: $x^2 - 7x - 18$
B1 Factorise: $x^2 + 9x + 20$	**B2** Factorise: $x^2 - 8x + 15$	**B3** Factorise: $x^2 - 5x + 4$	**B4** Factorise: $x^2 + 9x + 18$
C1 Factorise: $x^2 - 2x - 24$	**C2** Factorise: $x^2 + 11x + 24$	**C3** Factorise: $x^2 + 23x - 24$	**C4** Factorise: $x^2 - 14x + 24$
D1 Which of the following cannot be factorised: $x^2 + x + 42$ or $x^2 + x - 42$ Explain your answer.	**D2** Which of the following cannot be factorised: $x^2 + 9x - 14$ or $x^2 - 9x + 14$ Explain your answer.	**D3** b is an integer. Find the values of b for which the expression $x^2 + bx + 32$ can be factorised.	**D4** c is a positive integer. Find the values of c for which the expression $x^2 + 8x + c$ can be factorised.
E1 Factorise: $x^2 - x + \frac{1}{4}$	**E2** Factorise: $x^2 + x - \frac{3}{4}$	**E3** Factorise: $x^2 - x - \frac{4}{9}$	**E4** Factorise: $x^2 + x - \frac{14}{25}$

FACTORISING QUADRATICS

STAGE TWO

Ref: G227.2S2

A1 Factorise: $x^2 + x - 20$

1 × 20
2 × 10
4 × 5 *

$(x+5)(x-4)$

A2 Factorise: $x^2 - 2x - 15$

1 × 15
3 × 5 *

$(x+3)(x-5)$

A3 Factorise: $x^2 + 3x - 4$

1 × 4 *
2 × 2

$(x+4)(x-1)$

A4 Factorise: $x^2 - 7x - 18$

1 × 18
2 × 9 *
3 × 6

$(x+2)(x-9)$

B1 Factorise: $x^2 + 9x + 20$

1 × 20
2 × 10
4 × 5 *

$(x+4)(x+5)$

B2 Factorise: $x^2 - 8x + 15$

1 × 15
3 × 5 *

$(x-3)(x-5)$

B3 Factorise: $x^2 - 5x + 4$

1 × 4 *
2 × 2

$(x-1)(x-4)$

B4 Factorise: $x^2 + 9x + 18$

1 × 18
2 × 9
3 × 6 *

$(x+3)(x+6)$

C1 Factorise: $x^2 - 2x - 24$

1 × 24
2 × 12
3 × 8
4 × 6 *

$(x+4)(x-6)$

C2 Factorise: $x^2 + 11x + 24$

1 × 24
2 × 12
3 × 8 *
4 × 6

$(x+3)(x+8)$

C3 Factorise: $x^2 + 23x - 24$

1 × 24 *
2 × 12
3 × 8
4 × 6

$(x+24)(x-1)$

C4 Factorise: $x^2 - 14x + 24$

1 × 24
2 × 12 *
3 × 8
4 × 6

$(x-2)(x-12)$

D1 $x^2 + x - 42 = (x+7)(x-6)$

$x^2 + x + 42$ cannot be factorised because there are not any factor pairs of 42 that add to give '1'

D2 $x^2 - 9x + 14 = (x-2)(x-7)$

$x^2 + 9x - 14$ cannot be factorised because there are not any factor pairs of 14 that subtract to give '9'

D3 $x^2 + bx + 32$

1 × 32
2 × 16
4 × 8

looking at the factor pairs, the possible values for b are 33, 18, 12 (or -33, -18, -12)

D4 c is a positive integer.

The factor pairs must add to 8

$x^2 + 8x + c$

1 × 7
2 × 6
3 × 5
4 × 4

So c = 7, 12, 15 or 16

E1 Factorise: $x^2 - x + \frac{1}{4} = \left(x - \frac{1}{2}\right)\left(x - \frac{1}{2}\right)$

E2 Factorise: $x^2 + x - \frac{3}{4} = \left(x + \frac{3}{2}\right)\left(x - \frac{1}{2}\right)$

E3 Factorise: $x^2 - x - \frac{4}{9} = \left(x + \frac{1}{3}\right)\left(x - \frac{4}{3}\right)$

E4 Factorise: $x^2 + x - \frac{14}{25} = \left(x + \frac{7}{5}\right)\left(x - \frac{2}{5}\right)$