Factorising and Solving Quadratics (No Formula)

Memory

T - **Times** to make the

E - **End** value

A - **Add** to make the

M - **Middle** value

Example

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

T (+6)

E (1 x 6) (2 x 3) (-1 x -6) (-2 x -3)

A (+5) (1+6=7) (2+3=5) (-1+-6=-7) (-2+-3=-5)

M So $(x + 2)(x + 3)$

Solve: $x^2 + 5x + 6 = 0$

$$(x + 2)(x + 3) = 0$$

$x + 2 = 0 \qquad x + 3 = 0$

$x = -2 \qquad x = -3$

> Put each bracket equal to 0 to find both values of x.

Literacy

Write down keywords associated with factorising and why.
Can you find one totalling 11?

A B C D E F G H I J K L M N O P
Q R S T U V W X Y Z

Skill 1

Factorise the following into double brackets.

1) $x^2 + 7x + 10$ 9) $x^2 + 15x + 36$

2) $x^2 + 5x + 5$ 10) $x^2 - 8x + 16$

3) $x^2 + 7x + 12$ 11) $x^2 - 4x - 21$

4) $x^2 - 7x + 12$ 12) $x^2 - 5x - 24$

5) $x^2 + 6x + 8$ 13) $x^2 - 3y - 28$

6) $x^2 + 2x - 8$ 14) $x^2 - 9$

7) $x^2 - 2x - 8$ 15) $x^2 - 64$

8) $x^2 - 6x + 8$ 16) $x^2 - 26x - 165$

Skill 2

Solve the following quadratic equations

1) $x^2 + 7x + 15 = 0$ 9) $x^2 + 11x + 18 = 0$

2) $x^2 - 5x + 6 = 0$ 10) $x^2 - 4x - 12 = 0$

3) $x^2 - 6x + 9 = 0$ 11) $x^2 - 5x - 24 = 0$

4) $x^2 - 7x + 10 = 0$ 12) $x^2 - 9x + 18 = 0$

5) $x^2 + 6x + 8 = 0$ 13) $x^2 - 16 = 0$

6) $x^2 + 2x - 15 = 0$ 14) $x^2 - 81 = 0$

7) $x^2 - 4x - 21 = 0$ 15) $2x^2 - 3x - 2 = 0$

8) $x^2 + 11x + 24 = 0$ 16) $2x^2 + 7x - 15 = 0$

Stretch 1

Factorise fully

1) $2x^2 + 11x + 12$ 2) $3x^2 + 10x - 8$ 3) $3x^2 + 7x + 2$

4) $4x^2 - 23x + 15$ 5) $6x^2 + 7x + 2$ 6) $8x^2 - 10x - 3$

Stretch 2

Solve the following quadratic equations

1) $2x^2 + 5x + 3 = 0$ 2) $3x^2 + 8x + 4 = 0$ 3) $3x^2 - 5x - 2 = 0$

4) $4x^2 - 3x + 10 = 0$ 5) $6x^2 - 13x + 6 = 0$ 6) $10x^2 + 9x + 2 = 0$