

## FACTORISING : QUADRATICS

### Zero product property and factored quadratic equations

The **zero product property** states that if  $ab=0$ , then either a or b is equal to 0

For a quadratic equation such as  $(x-5)(x+2)=0$ , we know that either  $x-5=0$  or  $x+2=0$ . Solving these two linear equations gives us the two solutions to the quadratic equation.  $x=2$  and  $x=5$

What are the solutions to the equation

$$(x-4)(3x+1) = 0 ?$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$(x-1)(2x+3) = 0 ?$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$(2x-3)(2x-7) = 0 ?$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$(m+8)(m-2) = 0 ?$$

$$m = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$(2y+9)(2y-7) = 0 ?$$

$$y = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$(5x-1)(x+4) = 0 ?$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$(x+2)(2x+1) = 0 ?$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$-12(5x+1)(4x-5) = 0 ?$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation ?

$$(3x-5)(7x-7) = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

What are the solutions to the equation

$$\frac{5}{7}(5x-3)(x-7) = 0 ?$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

## Solving factorable quadratic equations

Solve the equation :  $x^2 - 2x - 3 = 0$  by factoring the given quadratic into  $(x+a)(x+b)$  , where :

$a+b$ =coefficient of  $x$  term , -2

$ab$  = constant term , -3

-3 and 1 would work such that  $-3 + 1 = -2$  and  $(-3)(1) = -3$

This means ,  $x^2 - 2x - 3 = 0$  can be re-written as  $(x-3)(x+1)$  and solve the quadratic equation using the zero product property.

Solve :

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

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 + 9x + 14 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 + 21x + 20 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 - 3x - 18 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 - 2x - 8 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 + 10x - 24 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 - 13x + 30 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 + 4x - 12 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 + 24x + 63 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 - 16x + 64 = 0$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$x^2 - 6x = 27$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

Solve :

$$w^2 + 2w = 8$$

$$w = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

### **BONUS PROBLEMS**

1) Solve :

$$y^2 + 9y + 2 = 8y + 58$$

$$y = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$

2) Solve :

$$x^2 + 70 = 17x$$

$$x = \underline{\hspace{2cm}} \text{ and } \underline{\hspace{2cm}}$$