Name _____ Date _____

Solving by Factorising

Example

Let us solve $x^2 - 5x + 6 = 0$. We look for two numbers whose **product is 6** and whose **sum is −5**

: they are -2 and -3 .

$x^2 - 5x + 6 = 0 \Rightarrow (x-2)(x-3) = 0 \Rightarrow x_1 = 2\ ,\ x_2 = 3$

You already know how to factorise trinomials from the Algebraic Expressions topic. Only the last step is new: the product is zero.

1 ON YOUR OWN Complete the table.

trinomial	product	sum	numbers	factorised
$x^2 + 7x + 12$	12	7	☐ ☐	☐
$x^2 - 8x + 15$	15	-8	☐ ☐	☐
$x^2 + 2x - 15$	-15	2	☐ ☐	☐
$x^2 - x - 12$	-12	-1	☐ ☐	☐
$x^2 - 6x + 9$	9	-6	☐ ☐	☐

2 ON YOUR OWN Solve by factorising.

$x^2 + 5x + 4 = 0$

$x_1 =$ ☐ $x_2 =$ ☐

$x^2 - 9x + 20 = 0$

$x_1 =$ ☐ $x_2 =$ ☐

$x^2 + x - 6 = 0$

$x_1 =$ ☐ $x_2 =$ ☐

$x^2 - 4x - 21 = 0$

$x_1 =$ ☐ $x_2 =$ ☐

$x^2 - 10x + 25 = 0$

$x_1 =$ ☐ $x_2 =$ ☐

$x^2 - 16 = 0$

$x_1 =$ ☐ $x_2 =$ ☐

Names (pair) _____ Date _____

Remember

First rearrange the equation so that the **right side is 0**. Then factorise the left side and **set each factor equal to zero**. If all the coefficients are divisible by the same number, divide the equation by it.

3 IN PAIRS Rearrange into the form $ax^2 + bx + c = 0$ and solve by factorising.

$x^2 = 3x + 10$

$x_1 =$ ☐ $x_2 =$ ☐

$x(x + 4) = 12$

$x_1 =$ ☐ $x_2 =$ ☐

$(x + 1)(x - 1) = 2x + 2$

$x_1 =$ ☐ $x_2 =$ ☐

$2x^2 - 8x - 10 = 0$

$x_1 =$ ☐ $x_2 =$ ☐

4 IN PAIRS Try to factorise $x^2 + 4x + 1$ using whole numbers. Which numbers have product 1? Why does it not work? What would we need for such equations?

5 ON YOUR OWN The product of two consecutive odd numbers is 63. What are the numbers? Find all the solutions.

★ ON YOUR OWN **Exit card.** Solve by factorising: $x^2 - 3x - 10 = 0$.