

## Factorising Trinomials

**Today we are learning...**

How to factorise trinomials.

**I will know if I have been successful if...**

I can identify a trinomial.

I can complete the first two terms in the brackets.

I can find the final two terms in the brackets.



What is a trinomial?

$$3x^2 + 5x - 9$$

$$x^2 + 7x - 8$$

$$-2x^2 + 5x + 8$$

## Examples

Factorise the trinomial...

$$a) x^2 + 7x + 12 = (x + 4)(x + 3)$$

add = 7 Multiply = 12

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

add = 8 multiply = 15

$$c) y^2 + 4y - 12 = (y + 6)(y - 2)$$

add = 4 multiply = -12

1. Factorise these trinomials :-

$$1) \quad (a) \quad x^2 + 2x + 1 = (x + \dots)(x + \dots) \quad (b) \quad a^2 + 3a + 2 = (a + \dots)(a + \dots) \quad (c) \quad k^2 + 7k + 10 = (k + \dots)(k + \dots) \quad (d) \quad d^2 + 9d + 14 = (d + \dots)(d + \dots)$$

$$(e) \quad x^2 - 2x + 1 \quad (f) \quad b^2 - 6b + 9 \quad (g) \quad c^2 - 9c + 18 \quad (h) \quad w^2 - 11w + 24$$

$$(i) \quad x^2 + 3x - 4 \quad (j) \quad n^2 + n - 6 \quad (k) \quad p^2 + 2p - 15 \quad (l) \quad q^2 + 3q - 18$$

$$(m) \quad x^2 - 3x - 4 \quad (n) \quad r^2 - 6r - 7 \quad (o) \quad y^2 - 4y - 12 \quad (p) \quad h^2 - 8h - 20 .$$

2. 2) Factorise the following quadratic expressions :-

$$(a) \quad x^2 - 5x - 6 \quad (b) \quad x^2 + 8x + 15 \quad (c) \quad x^2 - 4x - 5 \quad (d) \quad x^2 - 11x + 18$$

$$(e) \quad y^2 - 2y - 15 \quad (f) \quad y^2 + 7y - 8 \quad (g) \quad y^2 - 9y + 14 \quad (h) \quad y^2 + 8y + 12$$

$$(i) \quad a^2 - 14a + 49 \quad (j) \quad a^2 - 10a - 11 \quad (k) \quad a^2 + a - 30 \quad (l) \quad a^2 - 9a + 20$$

$$(m) \quad c^2 - 8c + 15 \quad (n) \quad c^2 + 4c - 21 \quad (o) \quad c^2 - 6c - 27 \quad (p) \quad c^2 - 10c + 16$$

$$(q) \quad k^2 + 9k - 10 \quad (r) \quad k^2 - 8k - 9 \quad (s) \quad k^2 - 2k - 35 \quad (t) \quad k^2 + 2k - 24$$

$$(u) \quad v^2 + 2v - 8 \quad (v) \quad v^2 - 13v + 30 \quad (w) \quad v^2 - v - 12 \quad (x) \quad v^2 - 13v + 40 .$$

- 1.
- |   |                  |   |                   |
|---|------------------|---|-------------------|
| a | $(x + 1)(x + 1)$ | b | $(a + 2)(a + 1)$  |
| c | $(k + 5)(k + 2)$ | d | $(d + 7)(d + 2)$  |
| e | $(x - 1)(x - 1)$ | f | $(b - 3)b - 3)$   |
| g | $(c - 6)(c - 3)$ | h | $(w - 3)(w - 8)$  |
| i | $(x + 4)(x - 1)$ | j | $(n + 3)(n - 2)$  |
| k | $(p + 5)(p - 3)$ | l | $(q + 6)(q - 3)$  |
| m | $(x - 4)(x + 1)$ | n | $(r - 7)(r + 1)$  |
| o | $(y - 6)(y + 2)$ | p | $(h - 10)(h + 2)$ |

- 2.
- |   |                   |   |                   |
|---|-------------------|---|-------------------|
| a | $(x - 6)(x + 1)$  | b | $(x + 3)(x + 5)$  |
| c | $(x - 5)(x + 1)$  | d | $(x - 9)(x - 2)$  |
| e | $(y - 5)(y + 3)$  | f | $(y + 8)(y - 1)$  |
| g | $(y - 7)(y - 2)$  | h | $(y + 6)(y + 2)$  |
| i | $(a - 7)(a - 7)$  | j | $(a - 11)(a + 1)$ |
| k | $(a + 6)(a - 5)$  | l | $(a - 4)(a - 5)$  |
| m | $(c - 5)(c - 3)$  | n | $(c + 7)(c - 3)$  |
| o | $(c - 9)(c + 3)$  | p | $(c - 8)(c - 2)$  |
| q | $(k + 10)(k - 1)$ | r | $(k - 9)(k + 1)$  |
| s | $(k - 7)(k + 5)$  | t | $(k + 6)(k - 4)$  |
| u | $(v + 4)(v - 2)$  | v | $(v - 3)(v - 10)$ |
| w | $(v - 4)(v + 3)$  | x | $(v - 8)(v - 5)$  |

Exam Style Question

Factorise  $3x^2 - 13x - 10$

$$= (3x \quad ) (x \quad )$$

To answer these questions we need to build upon the skills learned today!

Starter

Factorise the following...

1)  $x^2 + 6x + 9 = (x + \_)(x + \_)$

2)  $b^2 + 10b + 21 =$

3)  $t^2 + 7t - 30 =$

## Factorising Trinomials Continued

**Today we are learning...**

How to factorise trinomials.

**I will know if I have been successful if...**

I can identify a trinomial.

I can complete the first two terms in the brackets.

I can find the final two terms in the brackets.



### Help Guide

$$x^2 + 5x + 1$$

$$\longrightarrow (x + \_)(x + \_)$$

$$x^2 - 5x + 1$$

$$\longrightarrow (x - \_)(x - \_)$$

$$x^2 + 5x - 1$$

$$\longrightarrow (x + \_)(x - \_)$$

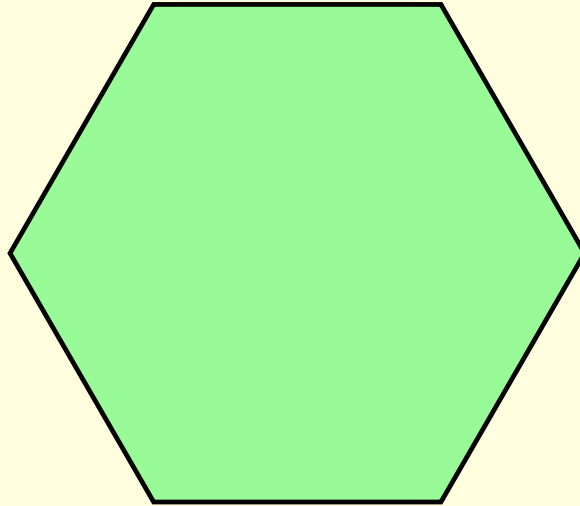
$$x^2 - 5x - 1$$

$$\longrightarrow (x + \_)(x - \_)$$

## Jigsaw

Cut **all** of the pieces of paper given to your group.

The finished puzzle should be this shape...



## Factorising Trinomials Continued

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### Starter

1) Factorise the following...

a)  $x^2 + 7x + 12 =$

b)  $y^2 - 3x - 4 =$

c)  $z^2 - 28z + 75 =$

### Difference of Two Squares

**Today we are learning...**

How to factorise a difference of two squares.

**I will know if I have been successful if...**

I can identify the two squared terms needed.

I can correctly state the first bracket.

I can correctly state the second bracket.



## Examples

Factorise the following...

1)  $x^2 - 81$

2)  $y^2 - 121$

3)  $4x^2 - 25$

## Exam Style Question

2000 P1	4. (a) Factorise $x^2 - 16$ .	1	
Ans	$(x - 4)(x + 4)$		