

Factorising

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Worked example

Factorise:

$$(x^2 - y^2) - (x - y)^2$$

Your turn

Factorise:

$$(n^2 - a^2) - (n - a)^2$$

$$2a(n - a)$$

Worked example

Factorise:

$$(x + y)^2 + (x + y)(2x + 5y)$$

$$(a + b)^2 - (a + b)(2a - 3b)$$

Your turn

Factorise:

$$(p + q)^2 + (p + q)(4p + 9q)$$
$$5(p + q)(p + 2q)$$

Worked example

Factorise fully:

$$(r - 3)^{12} - (r - 3)^{11}$$

$$(q + 3)^{12} - (q + 3)^{10}$$

Your turn

Factorise fully:

$$(p + 6)^{11} - (p + 6)^{10}$$

$$(p + 6)^{10}(p + 5)$$

Worked example

Factorise:

$$3x^2 + 10x + 3$$

$$3x^2 + 10x + 8$$

$$3x^2 + 14x + 8$$

Your turn

Factorise:

$$5x^2 + 8x + 3$$
$$(5x + 3)(x + 1)$$

$$5x^2 + 16x + 12$$
$$(5x + 6)(x + 2)$$

$$5x^2 + 32x + 12$$
$$(5x + 2)(x + 6)$$

Worked example

Factorise:

$$4x^2 - 9y^2$$

$$9x^2 - 16y^2$$

Your turn

Factorise:

$$25x^2 - 36y^2$$

$$(5x + 6y)(5x - 6y)$$

Worked example

Write N as the product of two integers, both greater than 1000:

$$3^{14} - 16$$

$$5^{10} - 9$$

Your turn

Write N as the product of two integers, both greater than 1000:

$$N = 2^{22} - 1$$

$$2049 \times 2047$$

Worked example

Factorise:

$$4x^4 - 9y^2$$

$$9x^8 - 16y^6$$

Your turn

Factorise:

$$25x^{12} - 36y^6$$

$$(5x^6 + 6y^3)(5x^6 - 6y^3)$$

Worked example

Factorise fully

$$y^4 - 16$$

Your turn

Factorise fully

$$x^4 - 1$$

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

Worked example

$$x^3 + ax^2 + bx + 36$$

factorises to

$$(x + c)^2(x + d)$$

a, b, c and d are positive integers and $c \neq 1$.

Work out the values of a, b, c and d

Your turn

$$x^3 + ax^2 + bx + 150$$

factorises to

$$(x + c)^2(x + d)$$

a, b, c and d are positive integers and $c \neq 1$.

Work out the values of a, b, c and d

$$a = 16, b = 85, c = 5, d = 6$$