

quadratic binomials

$$ax^2 + bx$$

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terminology

terminology

quadratic polynomials

monomial

$$x^2$$

$$6x^2$$

binomial

$$3x^2 - 12$$

$$5x^2 + 2x$$

$$3 - 2x^2$$

trinomial

$$x^2 + 4x - 5$$

$$5x^2 - x - 6$$

terminology

terms and coefficients

The quadratic binomial $ax^2 + bx$ is in descending powers of the variable x .

The quadratic binomial $2x^2 - 7x$ has two terms $2x^2$ and $-7x$.

2 and -7 are the coefficients of the x^2 and x terms.

The x term is $-7x$ with a coefficient of (-7) .

Take account of the $+$ or the $-$ operator when finding coefficients.

terminology

technique

technique

descending powers of x

We often prefer to work with polynomials in descending powers of the variable.

If we receive a polynomial in ascending powers we can reorder it in descending powers of the variable.

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

$$x - 3x^2 = -3x^2 + x$$

We can, of course, leave the polynomial in ascending powers when appropriate.

technique

common factor

One of the first steps in factorizing any polynomial is to factor out a common numerical factor.

Factor out the greatest common numerical factor where it makes sense.

When the first term has a negative coefficient we also factor out negative one .

If there is a variable common to all terms, factor out one with the lowest exponent.

technique

examples

examples

quadratic binomials

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

$$6x^2 - x = x(6x - 1)$$

$$5x^2 - 15x = 5x(x - 3)$$

$$7x^2 - 7x = 7x(x - 1)$$

$$6x^2 + 3x = 3x(2x + 1)$$

$$15x^2 - 21x = 3x(5x - 7)$$

examples

quadratic binomials

$$15x - 5x^2 = 5x(3 - x)$$

$$\begin{aligned} 15x - 5x^2 &= -5x^2 + 15x \\ &= -5x(x - 3) \end{aligned}$$

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

$$\begin{aligned} x - x^2 &= -x^2 + x \\ &= -x(x - 1) \end{aligned}$$

here we optionally reorder in
descending powers of x

examples