Unit 7 Glossary Terms

Quadratic expression

A quadratic expression in x is one that is equivalent to an expression of the form $ax^2 + bx + c$, where a, b, c and are constants and $a \neq 0$.

Quadratic equation

An equation that is equivalent to one of the form $ax^2 + bx + c$, where a, b, c and are constants and $a \neq 0$.

zero(of a function)

A zero of a function is an input that yields an output of zero. If other words, if $f(a) = 0$ then a is a zero of f.

Factored form (of a quadratic expression)

A quadratic expression that is written as the product of a constant times two linear factors is said to be in factored form.

For example, $2(x - 1)(x + 3)$ and $(5x + 2)(3x - 1)$ are both in factored form.

Standard form (of a quadratic expression)

The standard form of a quadratic expression in x is $ax^2 + bx + c$, where a, b, and c are constants, and a is not 0.

Zero product property

The zero product property says that if the product of two numbers is 0, then one of the numbers must be 0.

Coefficient

In an algebraic expression, the coefficient of a variable is the constant the variable is multiplied by. If the variable appears by itself then it is regarded as being multiplied by 1 and the coefficient is 1.

The coefficient of in the expression $3x + 2$ is 3. The coefficient of p in the expression $5 + p$ is 1.

Constant term

In an expression like $5x - 2$ the number 2 is called the constant term because it doesn't change when x changes.

In the expression $5x - 8$ the constant term is -8, because we think of the expression as $5x + (-8)$. In the expression $12x - 4$ the constant term is -4.

Linear term

The linear term in a quadratic expression (In standard form)$ax^2 + bx + c$, where a, b, c and are constants, is the term bx.

(If the expression is not in standard form, it may need to be rewritten in standard form first.)

Perfect square

A perfect square is an expression that is something times itself. Usually we are interested in situations where the something is a rational number or an expression with rational coefficients.

Rational number

A rational number is a fraction or the opposite of a fraction. Remember that a fraction is a point on the number line that you get by dividing the unit interval into b equal parts and finding the point that is a of them from 0. We can always write a fraction in the form $\frac{a}{b}$ where a and b are whole numbers, with b not equal to 0, but there are other ways to write them. For example, 0.7 is a fraction because it is the point on the number line you get by dividing the unit interval into 10 equal parts and finding the point that is 7 of those parts away from 0. We can also write this number as $\frac{7}{10}$.

The numbers 3, $-\frac{3}{4}$, 6.7 and are all rational numbers. The numbers π and $-\sqrt{2}$ are not rational numbers, because they cannot be written as fractions or their opposites.

Completing the square

Completing the square in a quadratic expression means transforming it into the form $a\ (x\ +\ p)^2\ -\ q$, where a , p , q and are constants.

Completing the square in a quadratic equation means transforming into the form $a\ (x\ +\ p)^2\ =\ q$.

Irrational number

An irrational number is a number that is not rational. That is, it cannot be expressed as a positive or negative fraction, or zero.

Quadratic formula

The formula $x\ =\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ that gives the solutions of the quadratic equation $ax^2\ +\ bx\ +\ c\ =\ 0$, where a is not 0.

Vertex form (of a quadratic expression)

The vertex form of a quadratic expression in x is $a\ (x\ -\ h)^2\ +\ k$, where a , h , k and are constants, and a is not 0.

Maximum

A maximum of a function is a value of the function that is greater than or equal to all the other values. The maximum of the graph of the function is the corresponding highest point on the graph.

Minimum

A minimum of a function is a value of the function that is less than or equal to all the other values. The minimum of the graph of the function is the corresponding lowest point on the graph.