Important Quadratic Equation Formulas PDF

Formulas
Examples
with Units

List of 17
Important Quadratic Equation Formulas

1) Difference of Roots of Quadratic Equation Formula

Evaluate Formula

Formula

$$D'_{(x1-x2)} = \frac{\sqrt{D}}{a}$$

Example

$$10 = \frac{\sqrt{400}}{2}$$

2) Discriminant of Quadratic Equation Formula

Evaluate Formula

Formula

$$D = \left(b^2\right) - \left(4 \cdot a \cdot c\right)$$

Example

$$400 = \left(8^2\right) - \left(4 \cdot 2 \cdot -42\right)$$

3) First Root of Quadratic Equation Formula

Evaluate Formula

Formula

$$x_1 = \frac{-\left(b\right) + \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$$

Example

$$3 = \frac{-\left(8\right) + \sqrt{8^2 - 4 \cdot 2 \cdot -42}}{2 \cdot 2}$$

4) First Root of Quadratic Equation given Discriminant Formula

Evaluate Formula

Formula

$$x_1 = \frac{-b + \sqrt{D}}{2 \cdot a}$$

Example

$$3 = \frac{-8 + \sqrt{400}}{2 \cdot 2}$$

5) Maximum or Minimum Value of Quadratic Equation Formula

Evaluate Formula

Formula

$$f_{(x)Max/Min} = \frac{\left(4 \cdot a \cdot c\right) - \left(b^2\right)}{4 \cdot a}$$

Example

$$-50 = \frac{\left(4 \cdot 2 \cdot -42\right) - \left(8^2\right)}{4 \cdot 2}$$

6) Maximum or Minimum Value of Quadratic Equation using Discriminant Formula

Evaluate Formula

Formula

$$f_{(x)Max/Min} = -\frac{D}{4 \cdot a}$$

Example

$$-50 = -\frac{400}{4 \cdot 2}$$

7) Numerical Coefficient 'a' of Quadratic Equation Formula

Evaluate Formula

Formula

$$a = \frac{b^2 - D}{4 \cdot c}$$

Example

$$2 = \frac{8^2 - 400}{4 \cdot -42}$$

8) Numerical Coefficient 'b' of Quadratic Equation Formula

Evaluate Formula

Formula

$$b = \sqrt{D + \left(4 \cdot a \cdot c\right)}$$

Example

$$8 = \sqrt{400 + \left(4 \cdot 2 \cdot -42\right)}$$

9) Numerical Coefficient 'c' of Quadratic Equation Formula

Evaluate Formula

Formula

$$c = \frac{b^2 - D}{4 \cdot a}$$

Example

$$-42 = \frac{8^2 - 400}{4 \cdot 2}$$

10) Product of Roots of Quadratic Equation Formula

Evaluate Formula

Formula

$$P_{(x1 \times x2)} = \frac{c}{a}$$

Example

$$-21 = \frac{-42}{2}$$

11) Product of Roots of Quadratic Equation given Roots Formula

Evaluate Formula

Formula

$$P_{(x1 \times x2)} = x_1 \cdot x_2$$

Example

$$-21 = 3 \cdot -7$$

12) Second Root of Quadratic Equation Formula

Evaluate Formula

Formula

$$x_2 = \frac{-\left(b\right) - \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$$

Example

$$-7 = \frac{-\left(8\right) - \sqrt{8^2 - 4 \cdot 2 \cdot -42}}{2 \cdot 2}$$

13) Second Root of Quadratic Equation given Discriminant Formula

Evaluate Formula

Formula

$$x_2 = \frac{-b - \sqrt{D}}{2 \cdot a}$$

Example

$$-7 = \frac{-8 - \sqrt{400}}{2 \cdot 2}$$

14) Sum of Roots of Quadratic Equation Formula

Evaluate Formula

Formula

$$S_{(x1+x2)} = -\frac{b}{a}$$

Example

$$-4 = -\frac{8}{2}$$

15) Sum of Roots of Quadratic Equation given Roots Formula

Evaluate Formula

Formula

$$S_{(x1+x2)} = \left(x_1\right) + \left(x_2\right)$$

Example

$$-4 = \left(3\right) + \left(-7\right)$$

16) Value of Quadratic Equation Formula

Evaluate Formula

Formula

$$f_{(x)} = \left(a \cdot x^2\right) + \left(b \cdot x\right) + \left(c\right)$$

Example

$$48 = \left(2 \cdot 5^2\right) + \left(8 \cdot 5\right) + \left(-42\right)$$

17) Value of X for Maximum or Minimum Value of Quadratic Equation Formula

Evaluate Formula

Formula

$$x_{Max/Min} = -\frac{b}{2 \cdot a}$$

Example

$$-2 = -\frac{8}{2 \cdot 2}$$

Variables used in list of Quadratic Equation Formulas above

- **a** Numerical Coefficient a of Quadratic Equation
- **b** Numerical Coefficient b of Quadratic Equation
- **c** Numerical Coefficient c of Quadratic Equation
- **D** Discriminant of Quadratic Equation
- $D'_{(x1-x2)}$ Difference of Roots of Quadratic Equation
- $f_{(x)}$ Value of Quadratic Equation
- $f_{(x)Max/Min}$ Maximum/Minimum Value of Quadratic Equation
- $P_{(x1\times x2)}$ Product of Roots
- $S_{(x1+x2)}$ Sum of Roots
- **x** Value of X of Quadratic Equation
- x_1 First Root of Quadratic Equation
- x_2 Second Root of Quadratic Equation
- $x_{Max/Min}$ Value of X for Maximum/Minimum Value of f(X)

Constants, Functions, Measurements used in list of Quadratic Equation Formulas above

- Functions: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.

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