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# Quadratic Equation Formulas

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# List of 11 Quadratic Equation Formulas

## Quadratic Equation

### 1) Discriminant of Quadratic Equation

$$fx \quad D = (b^2) - (4 \cdot a \cdot c)$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b\_img.jpg\)](#)

$$ex \quad 400 = ((8)^2) - (4 \cdot 2 \cdot -42)$$

### 2) First Root of Quadratic Equation

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

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d\_img.jpg\)](#)

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

### 3) Maximum or Minimum Value of Quadratic Equation

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

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d\_img.jpg\)](#)

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



#### 4) Maximum or Minimum Value of Quadratic Equation using Discriminant



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

[Open Calculator](#)

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

#### 5) Product of Roots of Quadratic Equation

$$fx \quad P_{(x_1 \times x_2)} = \frac{c}{a}$$

[Open Calculator](#)

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

#### 6) Product of Roots of Quadratic Equation given Roots

$$fx \quad P_{(x_1 \times x_2)} = x_1 \cdot x_2$$

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


#### 7) Second Root of Quadratic Equation

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

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



8) Sum of Roots of Quadratic Equation 

$$fx \quad S_{(x_1+x_2)} = -\frac{b}{a}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95\_img.jpg\)](#)


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

9) Sum of Roots of Quadratic Equation given Roots 

$$fx \quad S_{(x_1+x_2)} = (x_1) + (x_2)$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2\_img.jpg\)](#)


$$ex \quad -4 = (3) + (-7)$$

10) Value of Quadratic Equation 

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

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7\_img.jpg\)](#)

$$ex \quad 48 = (2 \cdot (5)^2) + (8 \cdot 5) + (-42)$$

11) Value of X for Maximum or Minimum Value of Quadratic Equation 

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

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b\_img.jpg\)](#)

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



## Variables Used

- **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
- **$f(x)$**  Value of Quadratic Equation
- **$f(x)$ Max/Min** Maximum/Minimum Value of Quadratic Equation
- **$P_{(x_1 \times x_2)}$**  Product of Roots
- **$S_{(x_1 + x_2)}$**  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

- **Function:** `sqrt`, `sqrt(Number)`  
*Square root function*



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