

Quadratic Equation

only one type of variable

Power of variable 2/4/6/8/10...

$$\boxed{ax^2 + bx + c = 0}$$

✓ $a, b, c \rightarrow$ NO/Constants

✓ $x \rightarrow$ Variable

✓ $\boxed{a \neq 0}$

$$4) 3x^2 + 17x = 24$$

$$3x^2 + 17x - 24 = 0$$

$$a=3 \quad b=17 \quad c=-24$$

$$1) x^2 + 7x + 12 = 0$$

$$a=1 \quad b=7 \quad c=12$$

$$2) x^2 + 7x = 0$$

$$a=1 \quad b=7 \quad c=0$$

$$3) x^2 - 25 = 0$$

$$a=1 \quad b=0 \quad c=-25$$

$$1) x^2 + 12x + 35 = 0$$

$$\underline{a=1} \quad b=12 \quad \underline{c=35}$$

$$\begin{array}{c} 35 \\ \swarrow \quad \searrow \\ 7 \quad 5 \end{array} \rightarrow \text{factors}$$

$$\boxed{x = -7 / -5}$$

~~$$x^2 + 7x + 5x + 35 = 0$$~~

~~$$x(x+7) + 5(x+7) = 0$$~~

~~$$(x+7)(x+5) = 0$$~~

~~$$x+7=0 / x+5=0$$~~

~~$$x = -7$$~~

~~$$x = -5$$~~

Roots

$$2) x^2 + 15x + 56 = 0$$

$$\begin{array}{c} 56 \\ \swarrow \quad \searrow \\ 7 \quad 8 \end{array} \rightarrow \text{factors}$$

$$x^2 + 7x + 8x + 56 = 0$$

$$x(x+7) + 8(x+7) = 0$$

$$(x+7)(x+8) = 0$$

$$x+7=0 / x+8=0$$

$$\boxed{x = -7} / \boxed{x = -8} \rightarrow \text{Roots}$$

$$3) x^2 + 14x + 48 = 0$$

$$\begin{array}{c} 48 \\ \swarrow \quad \searrow \\ 6 \quad 8 \end{array} \rightarrow \text{factors}$$

$$x^2 + 6x + 8x + 48 = 0$$

$$x(x+6) + 8(x+6) = 0$$

$$(x+6)(x+8) = 0$$

$$x+6=0 / x+8=0$$

$$\boxed{x = -6} / \boxed{x = -8}$$

Roots

$$1) x^2 + 12x + 20 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ 10 & 2 \end{array}$$

$$\boxed{x = -10/-2}$$

$$2) x^2 + 13x + 42 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ 6 & 7 \end{array}$$

$$\boxed{x = -6/-7}$$

$$3) x^2 + 14x + 40 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ 10 & 4 \end{array}$$

$$\boxed{x = -10/-4}$$

$$4) x^2 + 18x + 45 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ 15 & 3 \end{array}$$

$$\boxed{x = -15/-3}$$

$$5) x^2 + 19x + 78 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ 13 & 6 \end{array}$$

$$\boxed{x = -13/-6}$$

$$6) x^2 - 16x + 55 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ -11 & -5 \end{array}$$

$$\boxed{x = 11/5}$$

$$7) x^2 - 14x + 24 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ -12 & -2 \end{array}$$

$$\boxed{x = 12/2}$$

$$8) x^2 - 2x - 48 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ -8 & 6 \end{array}$$

$$\boxed{x = 8/6}$$

$$9) x^2 + 3x - 40 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ 8 & -5 \end{array}$$

$$\boxed{x = -8/5}$$

$$10) x^2 + 4x - 60 = 0$$

$$\begin{array}{cc} & \swarrow \searrow \\ 10 & -6 \end{array}$$

$$\boxed{x = -10/6}$$

1) $x^2 + 12x + \underline{\underline{35}} = 0$	2) $x^2 - 12x + \underline{\underline{35}} = 0$	3) $x^2 + 2x - \underline{\underline{35}} = 0$	4) $x^2 - 2x - \underline{\underline{35}} = 0$
$\swarrow \quad \searrow$ 7 5	$\swarrow \quad \searrow$ -7 -5	$\swarrow \quad \searrow$ -7 -5	$\swarrow \quad \searrow$ -7 5
$x = -7/-5$	$x = 7/5$	$x = -7/5$	$x = 7/-5$

Sign Table for Quadratic Equation

	b	c	Factors		Roots	
			Largest	Smallest	Largest	Smallest
1)	+	+	+	+	-	-
2)	-	+	-	-	+	+
3)	+	-	+	-	-	+
4)	-	-	-	+	+	-

