

Solve the following by using any method you choose.

1) $x^2 + 11x + 28 = 0$

$$\begin{array}{r} 1 \times 4 \\ 1 \times 7 \\ \hline 4 + 7 = 11 \end{array}$$

$$(x+4)(x+7) = 0$$

$x+4=0$	$x+7=0$
$x = -4$	$x = -7$

3) $4x^2 + 6 = 10$

$$\begin{array}{r} -6 \quad -6 \\ \hline 4x^2 = 4 \\ \frac{4x^2}{4} = \frac{4}{4} \\ x^2 = 1 \\ \sqrt{x^2} = \sqrt{1} \end{array}$$

$$x = \pm 1$$

$a=2, b=-4, c=-3$

2) $2x^2 - 4x = 3 \Rightarrow 2x^2 - 4x - 3 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{4 \pm \sqrt{16 - 4(2)(-3)}}{2(2)}$$

$$= \frac{4 \pm \sqrt{16 + 24}}{4} = \frac{4 \pm \sqrt{40}}{4}$$

$\sqrt{40}$
 $\begin{array}{l} \swarrow \searrow \\ 2 \quad 20 \\ \swarrow \searrow \\ 2 \quad 10 \\ \swarrow \searrow \\ 2 \quad 5 \end{array}$

$$= \frac{4 \pm 2\sqrt{10}}{4}$$

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

4) $x^2 + 6x - 1 = 0$

$$\frac{b}{2} = \frac{6}{2} = 3$$

$$x^2 + 6x + \left(\frac{6}{2}\right)^2 = 1 + \left(\frac{6}{2}\right)^2$$

$$x^2 + 6x + 9 = 1 + 9$$

$$\sqrt{(x+3)^2} = \sqrt{10}$$

$$x+3 = \pm\sqrt{10}$$

$$x = -3 \pm \sqrt{10}$$

The **DISCRIMINANT** of a Quadratic Equation is $b^2 - 4ac$. The discriminant indicates the number of real solutions in a quadratic equation. Find the number of real solutions

If $b^2 - 4ac$ is > 0 (positive number)	The equation has 2 real solutions
If $b^2 - 4ac$ is $= 0$	The equation has 1 real solution
If $b^2 - 4ac$ is < 0 (negative number)	The equation has 0 real solutions

Must = 0

$a=4$ Ex) $4x^2 - 8x + 5 = 0$

$$\begin{aligned} b^2 - 4ac &= 64 - 4(4)(5) \\ &= 64 - 80 \\ &= -16 < 0 \end{aligned}$$

0 Real Solution

Ex) $15x^2 + 8x - 1 = 0$

$a=15$ $b^2 - 4ac = 64 - 4(15)(-1)$

$b=8$ $= 64 + 60$

$c=-1$ $= 124 > 0$

2 Real Solutions

Ex) $9x^2 - 1 = 0$ $a=9, b=0$

$$\begin{aligned} b^2 - 4ac &= 0 - 4(9)(-1) \\ &= 0 + 36 = 36 > 0 \end{aligned}$$

2 Real Solutions

ex) $25x^2 + 4 = 0$

$b^2 - 4ac = 0 - 4(25)(4)$ $a=25$

$= 0 - 400$ $b=0$

$= -400 < 0$ $c=4$

0 Real Solution

Ex) $4x^2 + 20x + 25 = 0$ $a=4$
 $b=20$

$$\begin{aligned} b^2 - 4ac &= 400 - 4(4)(25) \\ &= 400 - 400 = 0 \end{aligned}$$

1 Real Solution