

HW Quadratic Formula

1.) $x^2 + 9x - 10 = 0$ $a=1$ $b=9$ $c=-10$
$$x = \frac{-(-9) \pm \sqrt{(-9)^2 - 4(1)(-10)}}{2(1)} \Rightarrow x = \frac{-9 \pm 11}{2}$$
$$\begin{aligned} x &= \frac{-9+11}{2} = \frac{2}{2} = \boxed{1} \\ x &= \frac{-9-11}{2} = \frac{-20}{2} = \boxed{-10} \end{aligned}$$

2.) $3x^2 + 13x + 4 = 0$ $a=3$ $b=13$ $c=4$
$$x = \frac{-(13) \pm \sqrt{(13)^2 - 4(3)(4)}}{2(3)} \Rightarrow x = \frac{-13 \pm 11}{6}$$
$$\begin{aligned} x &= \frac{-13+11}{6} = \frac{-2}{6} = \boxed{-\frac{1}{3}} \\ x &= \frac{-13-11}{6} = \frac{-24}{6} = \boxed{-4} \end{aligned}$$

3.) $2x^2 - 5x = 7$ $x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(-7)}}{2(2)} \Rightarrow \frac{5 \pm 9}{4}$
 $2x^2 - 5x - 7 = 0$ $x = \frac{5+9}{4} = \frac{14}{4} = \boxed{\frac{7}{2}}$ $x = \frac{5-9}{4} = \frac{-4}{4} = \boxed{-1}$
 $a=2$ $b=-5$ $c=-7$

4.) $12 + 16x = 3x^2$ $x = \frac{-(-16) \pm \sqrt{(-16)^2 - 4(-3)(12)}}{2(-3)} \Rightarrow x = \frac{-16 \pm 20}{-6}$
 $-3x^2 + 16x + 12 = 0$ $x = \frac{-16+20}{-6} = \frac{4}{-6} = \boxed{-\frac{2}{3}}$ $x = \frac{-16-20}{-6} = \frac{-36}{-6} = \boxed{6}$
 $a=-3$ $b=16$ $c=12$

5.) $\sqrt{20} = \sqrt{4 \cdot 5} = \sqrt{4} \sqrt{5} = \boxed{2\sqrt{5}}$ 6.) $\sqrt{75} = \sqrt{25 \cdot 3} = \sqrt{25} \sqrt{3} = \boxed{5\sqrt{3}}$

7.) $\sqrt{45} = \sqrt{9 \cdot 5} = \sqrt{9} \sqrt{5} = \boxed{3\sqrt{5}}$ 8.) $\sqrt{242} = \sqrt{121 \cdot 2} = \sqrt{121} \sqrt{2} = \boxed{11\sqrt{2}}$

9.) $x^2 - 8x + 2 = 0$ $a=1$ $b=-8$ $c=2$
$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(2)}}{2(1)} \Rightarrow x = \frac{8 \pm \sqrt{56}}{2} \Rightarrow x = \frac{8 \pm 2\sqrt{14}}{2} \Rightarrow \boxed{x = 4 \pm \sqrt{14}}$$

10.) $2x^2 + 7x + 4 = 0$ $a=2$ $b=7$ $c=4$
$$x = \frac{-7 \pm \sqrt{(7)^2 - 4(2)(4)}}{2(2)} \Rightarrow x = \frac{-7 \pm \sqrt{17}}{4}$$

$$\begin{aligned}
 11.) \quad & \cancel{x^2} = 10x - 8 \quad X = \frac{-(-10) \pm \sqrt{(10)^2 - 4(-1)(-8)}}{2(-1)} \Rightarrow X = \frac{-10 \pm \sqrt{132}}{-2} \\
 & -x^2 \quad -x^2 \\
 & 0 = -x^2 + 10x - 8 \quad \Rightarrow X = \frac{-10 \pm 2\sqrt{33}}{-2} \Rightarrow \boxed{X = 5 \pm \sqrt{33}} \\
 & a = -1 \quad b = 10 \quad c = -8
 \end{aligned}$$

$$\begin{aligned}
 12.) \quad & 3x^2 - 7 = 6x \quad X = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(-7)}}{2(3)} \Rightarrow X = \frac{6 \pm \sqrt{120}}{6} \\
 & -6x \quad -6x \\
 & 3x^2 - 6x - 7 = 0 \quad \Rightarrow X = \frac{6 \pm 2\sqrt{30}}{6} \Rightarrow \boxed{X = 1 \pm \frac{\sqrt{30}}{3}} \\
 & a = 3 \quad b = -6 \quad c = -7
 \end{aligned}$$