

SOL HW 4.4

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Name: _____

Date: _____

Pre-Calculus 11 HW 4.4 The Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}, a \neq 0$$

1. Given each quadratic equation, indicate the values of the coefficients "a", "b" and "c":

a) $x^2 + 5x + 6 = 0$ $a = 1$ $b = 5$ $c = 6$	b) $12x^2 + 7x - 3 = 0$ $a = 12$ $b = 7$ $c = -3$	c) $-2x^2 - 7x + 5 = 0$ $a = -2$ $b = -7$ $c = 5$
d) $4x^2 = 13x - 8$ $4x^2 - 13x + 8 = 0$ $a = 4$ $b = -13$ $c = 8$	e) $x(7 - 8x) = 10$ $7x - 8x^2 = 10$ $0 = 8x^2 - 7x + 10$ $a = 8$ $b = -7$ $c = 10$	f) $x(x + 2) = 6 - (x - 3)(2x + 1)$ $x^2 + 2x = 6 - [2x^2 - 6x + x - 3]$ $x^2 + 2x = 6 - 2x^2 + 5x - 3$ $3x^2 - 3x - 9 = 0$ $x^2 - x - 3 = 0$ $a = 1$ $b = -1$ $c = -3$

2. Solve for "x" for each of the following by using the quadratic formula:

a) $x^2 - 5x + 6 = 0$ $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(6)}}{2(1)}$ $\frac{5 \pm \sqrt{1}}{2}$ $x = 3, 2$	b) $3x^2 - x + 1 = 3$ $3x^2 - x - 2 = 0$ $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\frac{-(-1) \pm \sqrt{(-1)^2 - 4(3)(-2)}}{2(3)}$ $\frac{1 \pm \sqrt{25}}{6}$ $x = 1, -\frac{2}{3}$	c) $2x^2 - 3x - 1 = 0$ $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-1)}}{2(2)}$ $\frac{3 \pm \sqrt{17}}{4}$ $x = 1.78, -0.28$
d) $-0.5x^2 + 4x + 12 = 0$ $-x^2 + 8x + 24 = 0$ $0 = x^2 - 8x - 24$ $a = 1$ $b = -8$ $c = -24$ $x = \frac{8 \pm \sqrt{64 - 4(1)(-24)}}{2}$ $\frac{8 \pm \sqrt{64 + 96}}{2}$ $= \frac{8 + \sqrt{160}}{2}, \frac{8 - \sqrt{160}}{2}$ $10.3245, -2.3245$	e) $-0.5x^2 + 3x = 6$ $a = -\frac{1}{2}$ $b = 3$ $c = -6$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $\frac{3 \pm \sqrt{9 - 4(\frac{1}{2})(-6)}}{2(-\frac{1}{2})}$ $\frac{3 \pm \sqrt{9 - 12}}{-1}$ $\frac{3 \pm \sqrt{-3}}{-1}$ $x = \frac{3 \pm \sqrt{-3}}{-1}$ 1.1. real soln	f) $-3x^2 = 12x - 5$ $0 = 3x^2 + 12x - 5$ $x = \frac{-12 \pm \sqrt{144 - 4(3)(-5)}}{2(3)}$ $x = \frac{-12 \pm \sqrt{204}}{6} = \frac{-12 + \sqrt{204}}{6}, \frac{-12 - \sqrt{204}}{6}$ $x = -4.31, 0.38$

<p>g) $3x(2x-6)=8$</p>	<p>h) $\frac{4x^2}{3}=4x-2$ $a=2$ $b=-6$ $c=3$ $4x^2=12x-6$ $4x^2-12x+6=0$ $12=\sqrt{4}\times\sqrt{3}$ $2x^2-6x+3=0$ $=2\sqrt{3}$ $x=\frac{6\pm\sqrt{36-4(2)(3)}}{2(2)}=\frac{6\pm\sqrt{12}}{4}$ $x=\frac{6\pm2\sqrt{3}}{4}=\frac{3\pm\sqrt{3}}{2}$</p>	<p>i) $x^2-2=-\frac{7x}{2}$ $a=2$ $b=7$ $c=-4$ $2x^2-4=-7x$ $2x^2+7x-4=0$ $x=\frac{-7\pm\sqrt{49-4(2)(-4)}}{4}$ $x=\frac{-7\pm\sqrt{49+32}}{4}=\frac{-7\pm 9}{4}$ $x_1=\frac{1}{2}$ $x_2=-4$</p>
<p>j) $2x^3-5x^2+7x=0$ $x(2x^2-5x+7)=0$ $x=0$ $2x^2-5x+7=0$ $a=2$ $b=-5$ $c=7$ $x=\frac{5\pm\sqrt{25-4(2)(7)}}{2(2)}$ <u>NEG.</u></p>	<p>k) $2x^2+6x-8=7x^2-2x$</p>	<p>l) $2(2x-1)^2+9(2x-1)+7=0$ $\text{LET } A=2x-1$ $2A^2+9A+7=0$ $A=\frac{-9\pm\sqrt{81-4(2)(7)}}{4}=\frac{-9\pm 5}{4}$ $A_1=-1$ $A_2=-\frac{7}{2}$ $2x-1=-1$ $2x-1=-3.5$ $2x=0$ $2x=-2.5$ $x=0$ $x=-1.25$</p>

3. Under what conditions will the equation have no solutions? $ax^2+bx+c=0$ Explain why

b^2-4ac is NEG \rightarrow No soln

4. Under what conditions will the equation have only one solution? $ax^2+bx+c=0$ Explain why

$b^2-4ac=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

5. The revenue a company makes for selling shoes is given by the equation: $R=-8p^2+1200p$, where "R" is the revenue and "p" is the price in dollars. At what price should the company sell their shoes to generate a revenue of \$400,000?

$400,000 = -8p^2 + 1200p$
 $8p^2 - 1200p + 400,000 = 0$
 $p^2 - 150p + 50,000 = 0$
 $p_1 =$ $p_2 =$

6. Here are the steps that John used to solve the equation: $12x^2-7x-3=0$. Find the mistakes:

$L_1: x = \frac{-7 \pm \sqrt{49^2 - 4(12)(3)}}{2(12)}$

$L_4: x = -7 \pm 1.9794955..$

$L_2: x = -7 \pm \frac{\sqrt{2401-144}}{24}$

$L_5: x_1 = -7 + 1.9794955.. = -5.0205...$

$L_3: x = -7 \pm \frac{\sqrt{2257}}{24}$

$L_6: x_2 = -7 - 1.9794955.. = -8.9794955..$

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