Warm Up   **5/8/19**

"Quiz 8 - 1"

Not a quiz, but still will be graded

Methods for solving quadratic functions

Factoring:

The equation needs to be in the form:
$$ax^2 + bx + c = 0$$

Factor completely and then set each factor equal to 0. Solve each equation for x.

Graphing:

The equation needs to be in the form:
$$y = ax^2 + bx + c$$

Graph the equation and identify the <u>roots</u>, aka the <u>x-intercepts</u>, or the <u>zeroes</u>.

SOLVE BY FACTORING

Steps:
1. Set the quadratic equation equal to zero
2. Factor
3. Set each factor equal to zero and solve for x
4. Write your answer using curly brackets

1. $x^2 + 4x + 3 = 0$

$a=1 \quad b=4 \quad c=3$

$ac = \dfrac{3}{1 \quad 3}$

$(x^2 + x) + 3x + 3 = 0$

$x(x+1)\,3(x+1) = 0$

$(x+3)(x+1) = 0$

$x+3=0 \qquad x+1=0$

$x=-3 \qquad x=-1$

$\{-3, -1\}$

2. $x^2 + 11x + 24 = 0$

$ac = 24$

$\dfrac{}{3 \quad 8}$

$(x^2 + 3x) + 8x + 24 = 0$

$x(x+3)\,8(x+3) = 0$

$(x+8)(x+3) = 0$

$x+8=0 \qquad x+3=0$

$x=-8 \qquad x=-3$

$\{-8, -3\}$

3. $x^2 + x - 2 = 0$

$ac = -2$

$2 \mid -1$

$(x^2 + 2x)(-x - 2) = 0$

$x(x + 2) - 1(x + 2) = 0$

$(x - 1)(x + 2) = 0$

$x - 1 = 0 \quad x + 2 = 0$

$x = 1 \quad x = -2$

$\{-2, 1\}$

4. $x^2 + 6x - 27 = 0$

$ac = -27$

$9 \mid -3$

$(x^2 + 9x)(-3x - 27) = 0$

$x(x + 9) - 3(x + 9) = 0$

$(x - 3)(x + 9) = 0$

$x - 3 = 0 \quad x + 9 = 0$

$x = 3 \quad x = -9$

$\{-9, 3\}$

5. $x^2 - 10x + 21 = 0$

6. $x^2 - x - 20 = 0$

9. $x^2 + 4x = 21$

$\underline{\quad -21 \quad -21 \quad}$

$x^2 + 4x - 21 = 0$

$x^2 + 7x - 3x - 21 = 0$

$x(x+7) - 3(x+7) = 0$

$(x-3)(x+7) = 0$

$x-3=0 \quad x+7=0$

$x=3 \quad\quad x=-7$

$\{-7, 3\}$

10. $x^2 - 45 = 4x$

$\underline{\quad -4x \quad -4x \quad}$

$x^2 - 4x - 45 = 0$

$\begin{array}{c} ac \\ -45 \\ \hline -9 \mid 5 \end{array}$ $(x^2 - 9x + 5x - 45 = 0$

$x(x-9) 5(x-9) = 0$

$(x+5)(x-9) = 0$

$x+5=0 \quad x-9=0$

$x=-5 \quad\quad x=9$

$\{-5, 9\}$

11. $x^2 - 5x - 64 = 7x$

$ac = -64$

$-16 | 4$

$-7x \qquad -7x$

$x^2 - 12x - 64 = 0$

$x^2 - 16x + 4x - 64 = 0$

$x(x-16) \; 4(x-16) = 0$

$(x+4)(x-16) = 0$

$x+4 = 0 \qquad x-16 = 0$

$x = -4 \qquad x = 16$

$\{-4, 16\}$

12. $x^2 - 10x + 49 = 4x + 1$

$-4x - 1 \qquad -4x - 1$

$x^2 - 14x + 48 = 0$

$(x^2 - 6x)(-8x + 48) = 0$

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

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

$x-8 = 0 \quad x-6 = 0$

$x = 8 \qquad x = 6$

$\{6, 8\}$

$$\frac{4x^2}{4} + \frac{4x}{4} - \frac{8}{4} = 0$$

$$4(x^2 + x - 2) = 0$$

$$4(x-1)(x+2)$$

$$\cancel{4=0} \quad x-1=0 \quad x+2=0$$

$$x=1 \quad x=-2$$