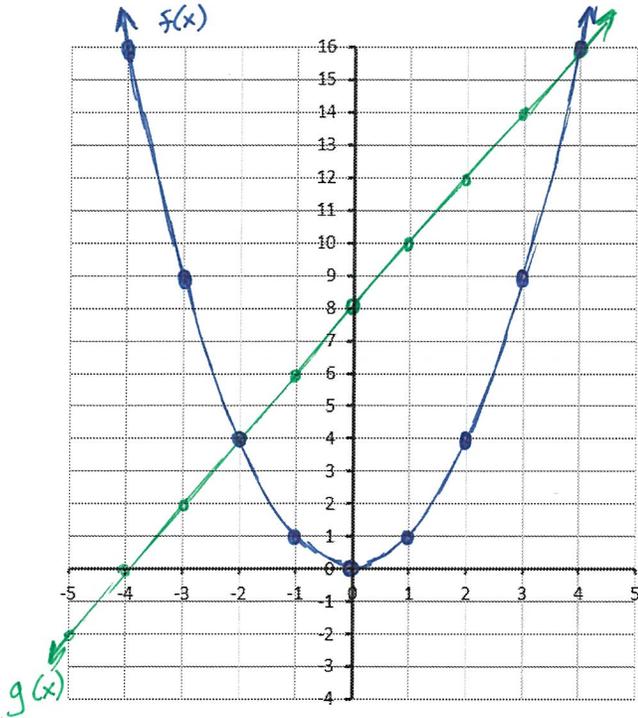


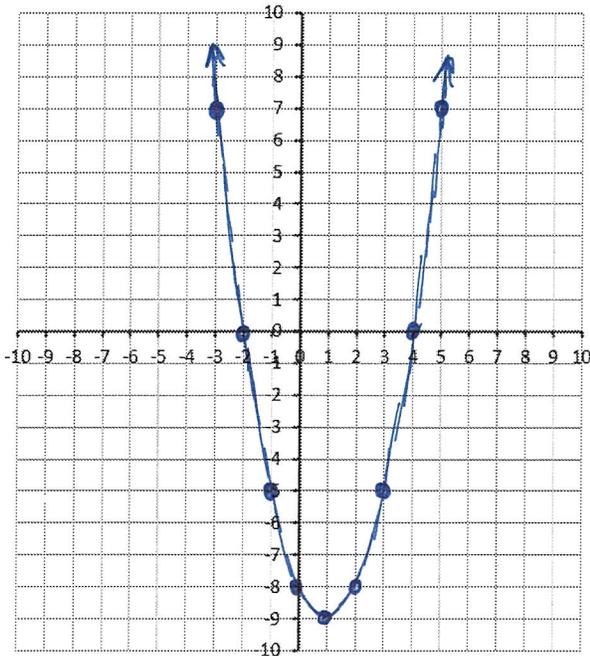
1.23 - Worksheet

Part 1: Solving Quadratics by Graphing

Q1a: Solve the equation  $x^2 = 2x + 8$  by graphing  $f(x) = x^2$  and  $g(x) = 2x + 8$



Q1b: Solve the equation  $x^2 = 2x + 8$  by converting to *Standard Form* and graphing that function.



$$x^2 = 2x + 8$$

$$-8 \quad -2x \quad -2x \quad -8$$

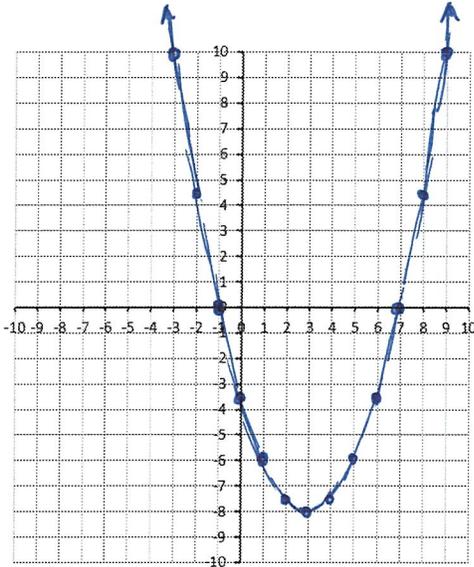
$$x^2 - 2x - 8 = 0$$

x	y
-3	7
-2	0
-1	-5
0	-8
1	-9
2	-8
3	-5
4	0
5	7

**Q2:** The solutions to the equation  $\frac{1}{2}x^2 - 3x = \frac{7}{2}$  can be determined through graphing. The solutions are **-a** and **+b**, where **a** and **b** are \_\_\_ and \_\_\_.  
 -1      +7

(Record your **two-digit** answer in the Numerical Response boxes below)

1	7		
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$$\frac{1}{2}x^2 - 3x - \frac{7}{2} = 0$$

$$y = \frac{1}{2}x^2 - 3x - \frac{7}{2}$$

x	y
-3	10
-2	4.5
-1	0
0	-3.5
1	-6
2	-7.5
3	-8
4	-7.5
5	-6
6	-3.5
7	0
8	4.5
9	10

Zeros at -1 and +7

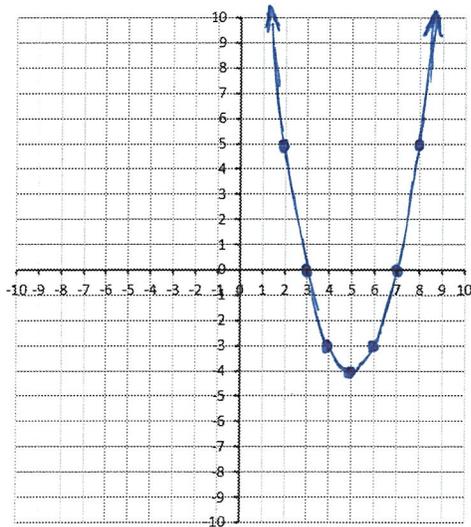
**Q3:** The solutions to the equation  $x^2 + 4x + 21 = 14x$  can be determined through graphing. The solutions are **+a** and **+b**, where **a** and **b** are \_\_\_ and \_\_\_.  
 +3      +7

(Record your **two-digit** answer in the Numerical Response boxes below)

3	7		
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or

7	3		
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$$x^2 + 4x + 21 = 14x$$

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

$$y = x^2 - 10x + 21$$

x	y
1	12
2	5
3	0
4	-3
5	-4
6	-3
7	0
8	5
9	12

Zeros at +3 and +7

## Part 2: Solving Quadratics by Factoring

Q4: Determine the solution to the equation  $x^2 + 9x + 20 = 0$  using factoring.

$$x^2 + 9x + 20 = 0$$

$$\begin{array}{l} +4 \quad +5 \\ \square + \square = 9 \\ \square \times \square = 20 \end{array}$$

$$(x + 4)(x + 5) = 0$$

$$\begin{array}{l} \swarrow \quad \searrow \\ x + 4 = 0 \quad x + 5 = 0 \\ -4 \quad -4 \quad -5 \quad -5 \\ \boxed{x = -4} \quad \boxed{x = -5} \end{array}$$

Q5: Determine the solution to the equation  $x^2 - 18 = 3x$  using factoring.

$$x^2 - 3x - 18 = 0$$

$$\begin{array}{l} -3x \quad -3x \\ +3 \quad -6 \\ \square + \square = -3 \\ \square \times \square = -18 \end{array}$$

$$(x + 3)(x - 6) = 0$$

$$\begin{array}{l} \swarrow \quad \searrow \\ x + 3 = 0 \quad x - 6 = 0 \\ -3 \quad -3 \quad +6 \quad +6 \\ \boxed{x = -3} \quad \boxed{x = 6} \end{array}$$

Q6: Determine the solution to the equation  $x^2 + x = 10 - 2x$  using factoring.

$$x^2 + 3x - 10 = 0$$

$$\begin{array}{l} +2x \quad +2x \\ +5 \quad -2 \\ \square + \square = 3 \\ \square \times \square = -10 \end{array}$$

$$(x + 5)(x - 2) = 0$$

$$\begin{array}{l} \swarrow \quad \searrow \\ x + 5 = 0 \quad x - 2 = 0 \\ -5 \quad -5 \quad +2 \quad +2 \\ \boxed{x = -5} \quad \boxed{x = 2} \end{array}$$

Q7: Determine the solution to the equation  $2x^2 + 7x + 6 = 0$  using factoring.

$$2x^2 + 7x + 6 = 0 \quad \begin{array}{l} +3 \quad +4 \\ \square + \square = 7 \\ \square \times \square = 12 \end{array}$$

$$2x^2 + 3x + 4x + 6 = 0$$

$$(2x^2 + 3x) + (4x + 6) = 0$$

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

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

$$\begin{array}{l} \downarrow \qquad \searrow \\ 2x+3=0 \qquad x+2=0 \\ \boxed{x = -3/2} \qquad \boxed{x = -2} \end{array}$$

Q8: Determine the solution to the equation  $2x^2 + 5x = 3$  using factoring.

$$2x^2 + 5x - 3 = 0 \quad \begin{array}{l} -3 \quad -3 \\ \square + \square = 5 \\ \square \times \square = -6 \end{array} \quad \begin{array}{l} 1,6 \\ 2,3 \end{array}$$

$$2x^2 - 1x + 6x - 3 = 0$$

$$(2x^2 - 1x) + (6x - 3) = 0$$

$$x(2x-1) + 3(2x-1) = 0$$

$$(2x-1)(x+3) = 0$$

$$\begin{array}{l} \downarrow \qquad \searrow \\ 2x-1=0 \qquad x+3=0 \\ \boxed{x = 1/2} \qquad \boxed{x = -3} \end{array}$$

Q9: Determine the solution to the equation  $8x^2 + 10x = 2x^2 - x + 10$  using factoring.

$$6x^2 + 11x - 10 = 0 \quad \begin{array}{l} -4 \quad +15 \\ \square + \square = 11 \\ \square \times \square = -60 \end{array} \quad \begin{array}{l} 1,60 \\ 2,30 \\ 3,20 \\ \boxed{4,15} \\ 5,12 \\ 6,10 \end{array}$$

$$6x^2 - 4x + 15x - 10 = 0$$

$$(6x^2 - 4x) + (15x - 10) = 0$$

$$2x(3x-2) + 5(3x-2) = 0$$

$$(3x-2)(2x+5) = 0$$

$$\begin{array}{l} \downarrow \qquad \searrow \\ 3x-2=0 \qquad 2x+5=0 \\ \boxed{x = 2/3} \qquad \boxed{x = -5/2} \end{array}$$