***Pre-Calculus 11***

***Unit 4: Analyzing Quadratic Functions***

***Worksheet 4.6—Analyzing Quadratic Functions of the form*** $y=ax^{2}+bx+c$

1. Identify the x-intercepts of the graph of each quadratic function.

 a) $y=\left(x-2\right)\left(x-4\right)$ b) $y=-\left(x-3\right)\left(x-5\right)$ c) $y=3\left(x+2\right)\left(x-4\right)$

2. Determine the zeros of each quadratic function.

 a) $y=\left(x+5\right)\left(x-1\right)$ b) $y=-2x\left(x-3\right)$ c) $y=\frac{1}{2}\left(x+4\right)\left(x-2\right)$

3. Determine the following characteristics of each quadratic function.

 i.) the y-intercept

 ii) the x-intercept

 iii) the equation of the axis of symmetry

 iv) the coordinates of the vertex of the graph

1. $y=\left(x+1\right)\left(x-3\right)$ b) $y=-2\left(x-2\right)\left(x-5\right)$ c) $y=\frac{1}{2}\left(x+6\right)\left(x-2\right)$

d) $ y=x^{2}+5x+6$ e) $y=4x^{2}+8x+3$ f) $y=-\frac{1}{4}x^{2}-x-1$

4. Graph each quadratic function in #3 above based on the characteristics that you found.

5. The graph of a quadratic function has *x*-intercepts 1 and 5 and passes through

 point $(7,-3)$

1. Write and equation of the function in factored form
2. Write an equation of the function in general form

6. The graph of a quadratic function has *x*-intercepts $-1$ and 3 and has a y-intercept of 6.

1. Write and equation of the function in factored form
2. Write an equation of the function in general form

7. The graph of a quadratic function has *x*-intercepts 2 and 4 and passes through point $(5, 9)$

1. Write and equation of the function in factored form
2. Write an equation of the function in general form

8. For each graph of a quadratic function, write the equation in factored form.

1.  b)

 c) d)

9. Given the following quadratic functions, if one x-intercept of the graph is 5, determine

 the other *x*-intercept and the value of k.

 a) $y=x^{2}-3x+k$ b) $y=x^{2}+kx+40$

***Solutions***

1. a) $x=2, x=4$ b) $x=3, x=5$ c) $x=-2, x=4$

2. a) $x=-5, x=1$ b) $x=0, x=3$ c) $x=-4, x=2$

3. a) i) $y=-3$ ii) $x=-1, x=3$ iii) $x=1$ iv) $(1,-4)$

 b) i) $y=-20$ ii) $x=2, x=5$ iii) $x=3.5$ iv) $(3.5, 4.5)$

 c) i) $y=-6$ ii) $x=-6, x=2$ iii) $x=-2$ iv) $(-2, -8)$

 d) i) $y=6$ ii) $x=-3, x=-2$ iii) $x=-2.5$ iv) $(-2.5, -0.25)$

 e) i) $y=3$ ii) $x=-\frac{1}{2}, x=-\frac{3}{2}$ iii) $x=-1$ iv) $(-1, -1)$

 f) i) $y=-1$ ii) $x=-2$ iii) $x=-2$ iv) $(-2, 0)$

4. a) b) c)

d) e) f)

5. a) $y=-\frac{1}{4}(x-1)\left(x-5\right)$ b) $y=-\frac{1}{4}x^{2}+\frac{3}{2}x-\frac{5}{4}$

6. a) $y=-2\left(x+1\right)\left(x-3\right)$ b) $y=-2x^{2}+4x+6$

7. a) $y=3\left(x-2\right)\left(x-4\right)$ b) $y=3x^{2}-18x+24$

8. a) $y=-\frac{1}{2}\left(x+1\right)\left(x-7\right)$ b) $y=2\left(x+6\right)\left(x+2\right)$

 c) $y=-2x(x-4)$ d) $y=-\frac{1}{4}\left(x+4\right)\left(x-4\right)$

9. a) $Other x-intercept=-2, k=-10$ b) $Other x-intercept=8, k=-13$