Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Accelerated Geometry

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_ Module 3 Test Review

**Determine the x AND y intercepts of the following functions:**

1) $f\left(x\right)=\frac{1}{3}(x-3)^{2}-7$ 2) $f\left(x\right)=-8x^{2}+x-5$

 3) $f\left(x\right)=-\left(x+8\right)^{2}+1$ 4) $f\left(x\right)=x^{2}-2x-15$

**Determine whether the given functions have a maximum or minimum value and where that value lies:**

5) $f\left(x\right)=4x^{2}-16x+5$ 6) $f\left(x\right)=-(4x)^{2}$

**Determine the vertex and end behavior of the given functions:**

7) $f\left(x\right)=-\frac{2}{5}\left(x+4\right)^{2}+6$ 8) $f\left(x\right)=5x^{2}+x+8$

**Graph each of the following functions and list the characteristics: (Separate paper)**

 **a) direction b) vertex c) AOS d) domain e) range**

 **f) X-intercepts G) Y-intercept h) Max/Min? Where? I) Int of Inc/Dec j) end behavior**

9) $f\left(x\right)=-3\left(x+1\right)^{2}+6$ 10) $f\left(x\right)=-2x^{2}-4$

11) $f\left(x\right)=\frac{3}{4}\left(x+2\right)^{2}-5$ 12) $f\left(x\right)=\frac{1}{4}x^{2}-3x+3$

13) $f\left(x\right)=-x^{2}-6x-7$ 14) $f\left(x\right)=(\frac{1}{4}x)^{2}+1$

**List the transformations for the following functions.**

15) $y=-(\frac{1}{6}x)^{2}+4$ 16) $f\left(x\right)=8(x+5)^{2}-1$

**Determine the transformations from the parent graph of** $y=x^{2}$**:**

17) $f\left(x\right)=-2x^{2}+8x-7$ 18) $f\left(x\right)=\frac{1}{3}x^{2}+x+4$

**Rewrite the following into standard form:**

19) $f\left(x\right)=\frac{2}{5}\left(x-5\right)^{2}+2$ 20) $f\left(x\right)=-\left(x+6\right)^{2}+11$

**Write a quadratic function with the following transformations of the parent graph** $f\left(x\right)=x^{2}$**.**

21) A horizontal stretch of 6, shift up 8, and a reflection over the y-axis

22) Vertical shrink by 1/4, shift right 3, shift down 1

23) Reflection over the x-axis, a horizontal shrink of 3/4,

**Determine the Domain, Range, and Intervals of Increase/Decrease of the functions:**

24) Use your answer to #20 25) Use your answer to #22

26) A dolphin jumps out of the water. The path the dolphin travels is modeled by $h=-0.2d^{2}+2d$ where h represents the height of the dolphin and d represents horizontal distance.

* What is the maximum height the dolphin reaches?
* How far did the dolphin jump?

27) A model rocket is launched from the roof of a building. Its flight path is modeled by $h\left(t\right)-5t^{2}+30t+10 $where h is the height of the rocket above the ground in meters and t is the time after the launch in seconds. What is the rocket’s maximum height?

28) If $f\left(x\right)= -\left(x+9\right)^{2}-7$ is shifted up 4 and right 2 and $g\left(x\right)=-3x^{2}-6x$ is shifted left 5 and down 7,

a) Which function has a higher maximum?

 b) Which function’s interval of decrease starts further right?

29) Use the average rate of change to determine over which interval is the function the steepest. $f\left(x\right)=-x^{2}-7x+3$

1. $\left[-9, -7\right]$ b) $\left[-7, -4\right]$ c. $\left[-1, 1\right]$

30) Given the function $f\left(x\right)=3x^{2}-24x+43$, convert to vertex form, then identify the range, interval of increase and interval of decrease.