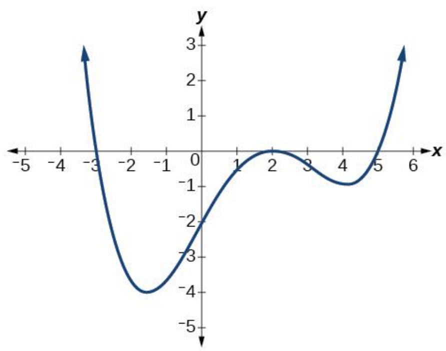
Name: ___________________________________________ Date: _____________ Period: ______________

*Sec 1H Unit 5 Day 4 – More Features of Functions Classwork*

*Can you predict where this graph will be when x = 50? What about when x = -1,000,000? Describing the "end behavior" of the graph involves making predictions about what direction the graph will continue to go as x gets positively very large, or negatively very large.*




1. When x = 50, what direction will this graph be going?

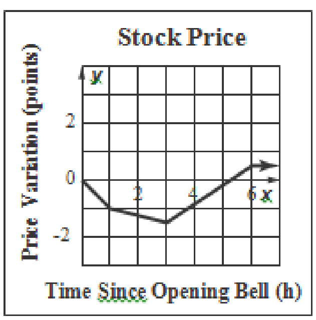
2. As x approaches infinity, what direction will the graph be going?

3. When x = -100, what direction will this graph be going?

4. As x approaches negative infinity, what will the graph be doing?

***Every graph will have two END BEHAVIOR statements.***
***One statement describes the far left of the graph:* As X approaches $-\infty$, Y ______________.**
***The other describes the far right of the graph:* As X approaches $\infty$, Y ______________.**
*For end behavior statements, we are not concerned with the middle of the graph.*
*These are some possible end behaviors:*
If the arrow points up, Y approaches ∞. If the arrow points down, Y approaches −∞.
If the arrow curves and flattens out, Y approaches whatever number it gets really close to.
If the arrow is exactly level on a number, Y equals that number.
If the graph doesn't continue on because it stops at a point, then Y does not exist when x is very large.

Give two end behavior statements for each of these graphs:





5. As **X** approaches $-\infty$, **Y** ______________.
   As **X** approaches $\infty$, **Y** ______________.

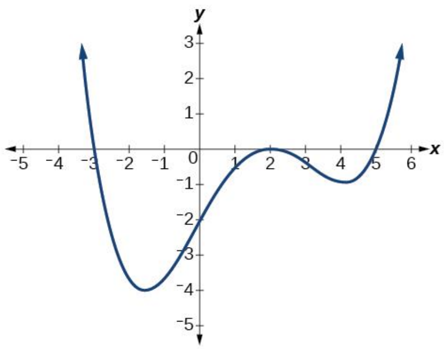
6. As **X** approaches $-\infty$, **Y** ______________.
   As **X** approaches $\infty$, **Y** ______________.

*Many of the graphs we are examining during this unit are made of different sections, or pieces. They are called "piecewise functions." If all of the sections are straight lines, we call it a "linear piecewise function." If some of the sections are curves, or just points, it is a "nonlinear piecewise function."*

7. Sketch a continuous, linear piecewise function.

8. Sketch a nonlinear, discrete function.

*Another characteristic of graphs is describing what the function is doing when x = 0 or when y = 0. These are called the intercepts. You should be familiar with the concept of the y-intercept; it is where the function crosses the y-axis, so x = 0 at that point. The x-intercepts are when the function crosses the x-axis, so y = 0 in those places.*



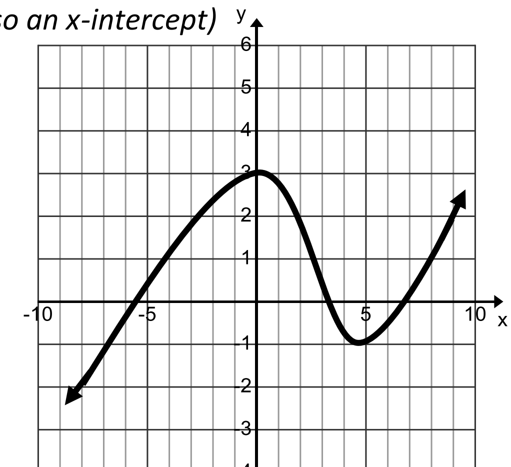

9. Name the y-intercept(s) of this function:

10. Name the x-intercept(s) of this function:

11. How many y-intercepts can a function have? Why?

12. How many x-intercepts can a function have? Why?

*It is sometimes useful to know when a graph is positive, which means all of the y-values are greater than 0, or when a graph is negative, which means all of the y-values are less than 0. When the y-values are equal to zero, it is neither positive nor negative; it is neutral. (Also an x-intercept)*




13. On what intervals is this graph positive?

14. When is it negative?

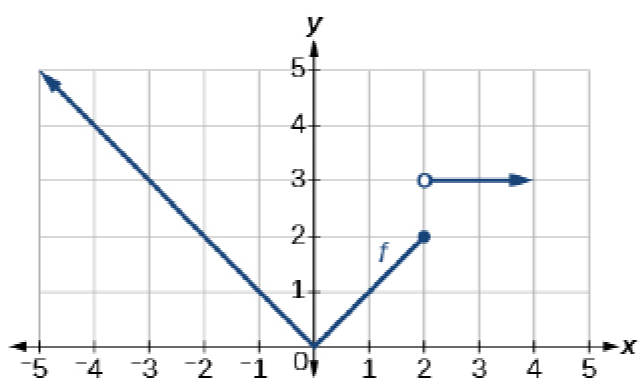
15. When is y increasing?

16. When is y decreasing?

17. Explain the difference between finding when a graph is positive and finding when it is increasing.

Putting it all together! Identify the important characteristics.

18.




Domain:

Range:

Maximum Point(s):

Minimum Point(s):

When is y increasing?

When is y decreasing?

When is the function positive?

When is the function negative?

x-intercept(s):

y-intercept(s):

As **X** approaches $-\infty$, **Y** _______________.

As **X** approaches $\infty$, **Y** _______________.