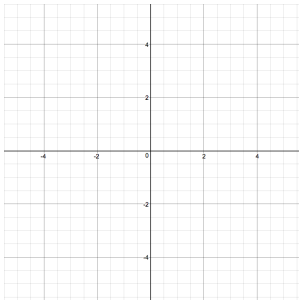
AAT Name _____

3-1 Graphs of Parent Functions Date _____ **A#1**

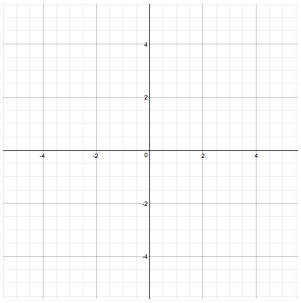
Goal: Become familiar with parent functions and their graphs, especially in regards to technology.

Warm Up: Graph each function below using your lovely calculator. Then sketch each in the coordinate planes.

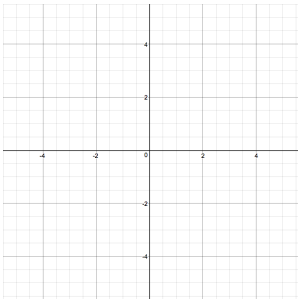
$f(x)=x$
(linear)



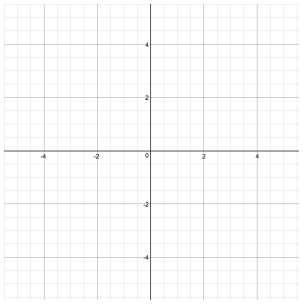
$f(x)=x^2$
(quadratic)



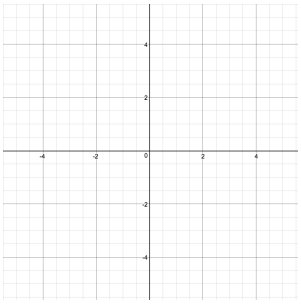
$f(x)=x^3$
(cubic)



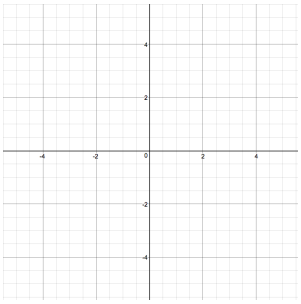
$f(x)=\sqrt{x}$
(square root)



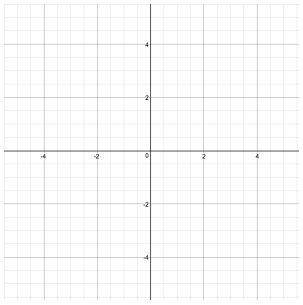
$f(x)=\frac{1}{x}$
(inverse)



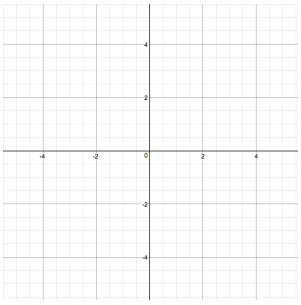
$f(x)=\frac{1}{x^2}$
(inverse square)



$f(x)=|x|$
(absolute value)



$f(x)=2^x$
(exponential growth)



Parent functions:

Questions

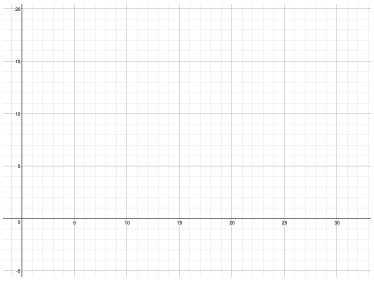
Questions

Based on the nature of _____, we can determine a _____ to account for special characteristics, points, etc.

Example 1: a. Display the graph $h(x) = -(x-20)^2 + 17$ in a appropriate window using your calculator. Then sketch it below.
b. State the domain and range of the function.

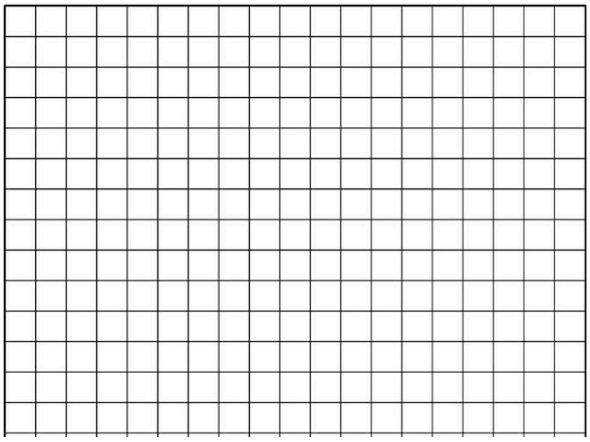
c. Explain why the window given is misleading.

a.



c.

Example 2: Graph the real function *h* with $h(x) = -9 - \sqrt{5-x}$ in a window that shows important features. Sketch your results below and state the domain and range.

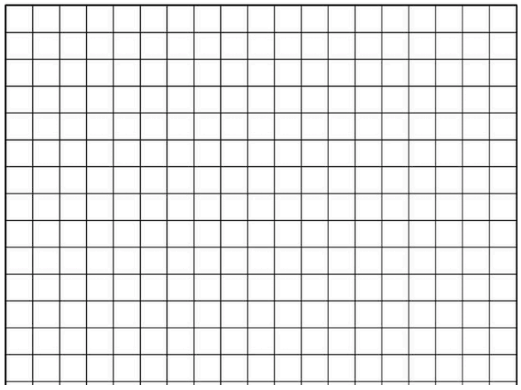


Questions

When functions are used to model real-world situations, the domain may be different (a subset) of the model domain.

Example 3: Hafiz makes a free throw in basketball practice. From its point of release, 6 ft in the air, the ball goes directly into the hoop which is 13 ft away and 10 ft high. An equation modeling the height $b(x)$ of the ball in feet at time *x* in seconds is $b(x) = -13x^2 + 19.5x + 6$.

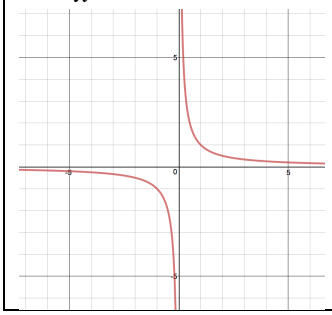
a. Create a graph that would be helpful in this context. In the sketch, label the important aspects of the ball's trajectory.
b. What is the domain and range of *b* within the context of this situation?



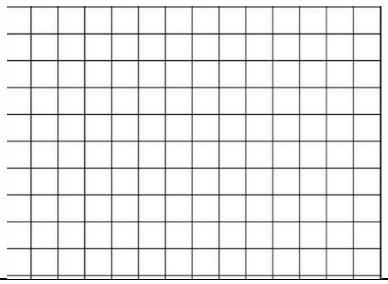
Asymptotes

The parent functions _____ and _____ have the *x*- and *y*-axes as asymptotes. Asymptotes that are not one of the axes are generally marked on the graph as a _____, which are not part of the graph but help explain the _____ of the function.

$y = \frac{1}{x}$



$y = \frac{1}{x-5}$



Summary