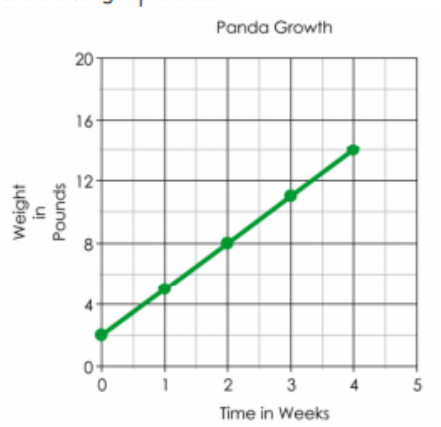
Functions Review Name: _____ A#____

1. The Metropolis Zoo recently celebrated the birth of two new baby pandas!

Mochi the panda cub has been measured and weighed each week since she was born.

Weeks	Weight
0	1
1	5
2	9
3	13

Mochi's brother is **Kappa**. His weight has been charted on the graph below.



a) Which panda was heavier when they were born?

b) Which panda is growing faster?

c) Which panda will weigh more at 5 weeks?

2. Sally and Sam are testing out their new potato shooters from their tree houses which are at different heights. The table shows the time, t, in seconds and height, h(t), in meters of the potato pieces shot from Sam's shooter. The time, t, and height, H(t), of Sally's potato shooter can be represented by the following equation.

Sally's Shooter:

$$H(t) = -t^2 + 4t + 5$$

Sam's Shooter:

t	0	0.5	1	1.5	2	2.5	3	3.5
h(t)	7	9	10	10	9	7	4	0

a) Whose potato pieces went higher? Find Sally's vertex by completing the square. Use your calculator to find Sam's.

b) Whose potato pieces stayed in the air longer, Sally's or Sam's? Show your work below and then justify your answer.

3. City A had a population of 18,850 people in 2010, and has been growing 8% each year. City B has been growing according to the following tables of values. City C has been decreasing in population according to the following model where t represents the number of years since 2010 $P(t) = 72000(0.97)^t$.

Years since 2010	Population City B
0	22,540
1	23,667
2	24,850

Which city will reach a population of 50,000 people first? In what year will this occur?

For each of the following identify functions identify the key features listed.

4. $y = 3(0.5)^x$

Sketch:

y-intercept:

Rate of growth/decay:

Domain:

Range:

End Behavior:

5. $y = (x-3)^2$

Sketch:

y-intercept:

x-intercept(s):

Vertex:

End Behavior:

Domain:

Range:

What is the parent function?

How has the parent function been shifted?

6. $y = |x+1| - 5$

Sketch:

y-intercept:

End Behavior:

Domain:

Range:

What is the parent function?

How has the parent function been shifted?

7. $y = \dfrac{9}{x-2} + 1$

Sketch:

y-intercept:

Horizontal Asymptote:

Vertical Asymptote:

Domain:

Range:

What is the parent function?

How has the parent function been shifted?

8. $y = -2x^3 + 2x^2 + 4x - 1$

Sketch:

y-intercept:

x-intercept(s):

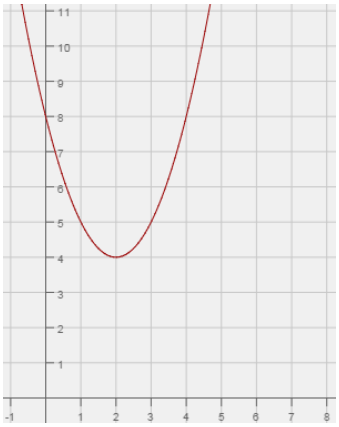
End Behavior:

Domain:

Range:

Is the function odd, even or neither?

9.



The graph to the left is a translation of the parent function $f(x) = x^2$

y-intercept:

End Behavior:

Vertex:

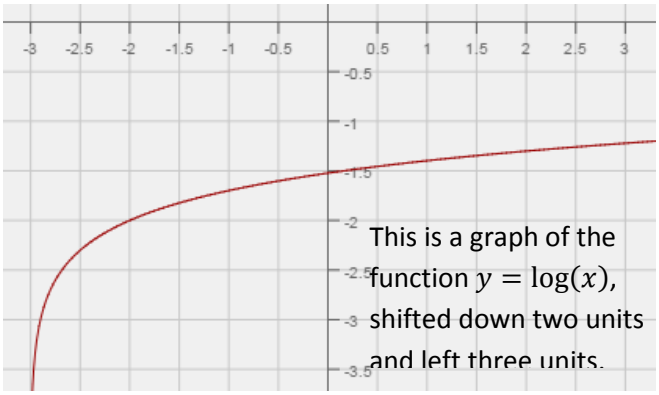
Domain:

Range:

How has the parent function been shifted?

Equation:

10.



This is a graph of the function $y = \log(x)$, shifted down two units and left three units.

Vertical Asymptote:

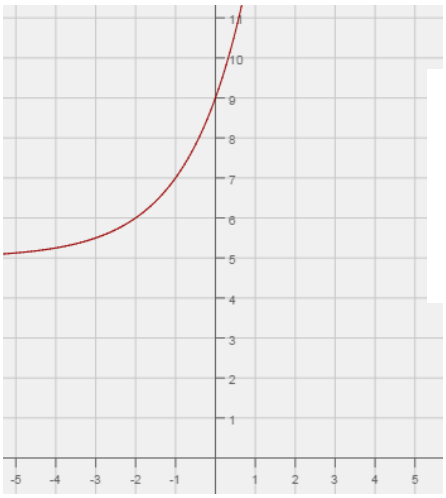
End Behavior:

Domain:

Range:

Equation:

11.



The graph to the left is a translation of the parent function $f(x) = 4(2)^x$

y-intercept:

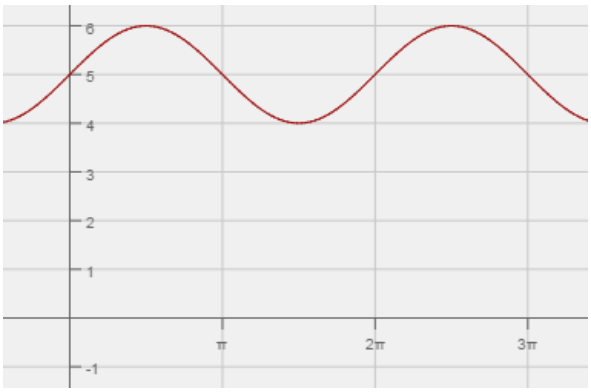
End Behavior:

Domain: Range:

How has the parent function been shifted?

Equation:

12.



y-intercept: Period:

Amplitude: Midline:

Domain: Range:

What is the parent function? How has the parent function been shifted?

Equation:

13. Use the graph to the right.

Domain:

Range:

Interval(s) of Increase:

Interval(s) of Decrease: