**Unit 5: Functions**

**Lesson 6: Graphing a story of function**

**Objectives:**

* I can graph a piecewise function to represent a story
* I can write functions to represent different parts of a piecewise function.
* I can write an absolute value function as a piecewise function.

**Agenda:**

Applications

Quick Review

**Vocabulary:**

Piecewise function, step function, story of a function

**Focus Questions:**

1. How do we write a piecewise function to represent a story?
2. How can we write an absolute value function as a piecewise function?

**Web Support:**

* <https://www.youtube.com/watch?v=IHf0NYr90VE>
* <https://www.youtube.com/watch?v=f2F1ZUlE4IA>

**Web Practice:**

* <http://www.shmoop.com/linear-equations/piecewise-functions-exercises.html>
* <https://www.khanacademy.org/math/algebra-home/alg-functions/alg-graphing-nonlinear-piecewise-functions/e/graphing-piecewise-functions>

**Homework:** Finish your 5-6 work

<https://www.youtube.com/watch?v=IHf0NYr90VE>

Do now:

1. Let *f* be a function such that *f*(*x*) = 3*x* − 4 is defined on the domain 1 ≤ *x* ≤ 6.
2. The range of this function is
3. 1 ≤ *f*(*x*) ≤ 6 3. −∞ ≤ *f*(*x*) ≤ 26
4. 26 ≤ *f*(*x*) ≤ 1 4. -1 ≤ *f*(*x*) ≤ 14
5. Calculate the average rate of change over the specific interval from part a.

2)Sam is babysitting during weekends. She charges 20 dollars initial fees and 5 dollars for every hour she babysits. Using the function M(h) = 5h + 20 will determine how much M-Money Sam makes for working h-hours.

* 1. Calculate and Interpret M(30)
	2. Sam is babysitting to buy the latest IPhone that she likes that costs $ 780. Determine how many hours Sam would need to work in order to buy the Phone.

3)Graph and evaluate the following piece wise function

 $f\left(x\right)=\left\{\begin{array}{c}-2 x<-2\\-x+1 -2\leq x\leq 0 \\x^{2}+1 0<x\end{array}\right.$

Evaluate the following based on the last piecewise function:

 f(-4) b. f(-1) c. f(2) -f(-1)

Working backwards: Writing functions from graphs:

4) Look at the following piecewise function and write an appropriate function that defines it:



 $f\left(x\right)=\left\{\begin{array}{c}\\\\\end{array}\right.$

1. Identify the domain and range.
2. The y-intercept



5) A substantial snowstorm is hitting the Northeast region and is predicted to snow at a rate of one-half inch per hour for the first four hours of the storm. The storm is supposed to pause for two hours and then resume at a rate of two inches per hour for the next five hours. The depth, *D(t)*, of the storm is the total number of inches of snow that has fallen at a given time.

1. Graph the snow depth as a function of time since the storm began for the length of the storm.

(b) Determine a piecewise linear function for *D(t)* as a function of the number of hours, *t*, since the storm began.

$$D(t)=\left\{\begin{array}{c}\\\\\end{array}\right.$$

5) Write a piece wise function for the following graph:

$$f\left(x\right)=\left\{\begin{array}{c}\\\end{array}\right.$$

6)The temperature is falling outside at a steady rate of 4 degrees Fahrenheit every hour. If the temperature starts at 68 Fahrenheit do the following. Fill out the table below for the outside temperature during the time it is cooling down.

1. Write a linear function that relates the Fahrenheit temperature, *F(t)*, to the time in hours, *t*, that it has been falling.
2. According to your function, what is the temperature when *t* =2.75 hours?
3. If this cooling continues at this constant rate, how many hours will it take for the temperature to reach the freezing point of water? Show your work.
4. a. Graph and fill the table of values for the following absolute value function:

 $ f\left(x\right)=\left|x+3\right|$. No need for a calculator.

1. Is it possible to rewrite this function in two pieces??

 $f\left(x\right)=\left\{\begin{array}{c}\\\end{array}\right.$