Warm Up

1. $f(x) = (x)^3 \rightarrow g(x) = (x + 6)^3$

2. $f(x) = (x)^3 \rightarrow g(x) = 2x^3 - 7$

3. $f(x) = \sqrt{x} \rightarrow g(x) = -7\sqrt{x} + 5$

4. $f(x) = \sqrt{x} \rightarrow g(x) = -\sqrt{(x-2)} + 4$

put this in your journal!

iPhone x

iPhone y= x

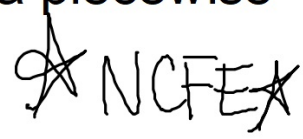
iPhone y= x²

iPhone y = x

1.5 I can...

1. Define, evaluate, and recognize graphs of piecewise functions.

2. Determine constants that would make a piecewise function **continuous**.

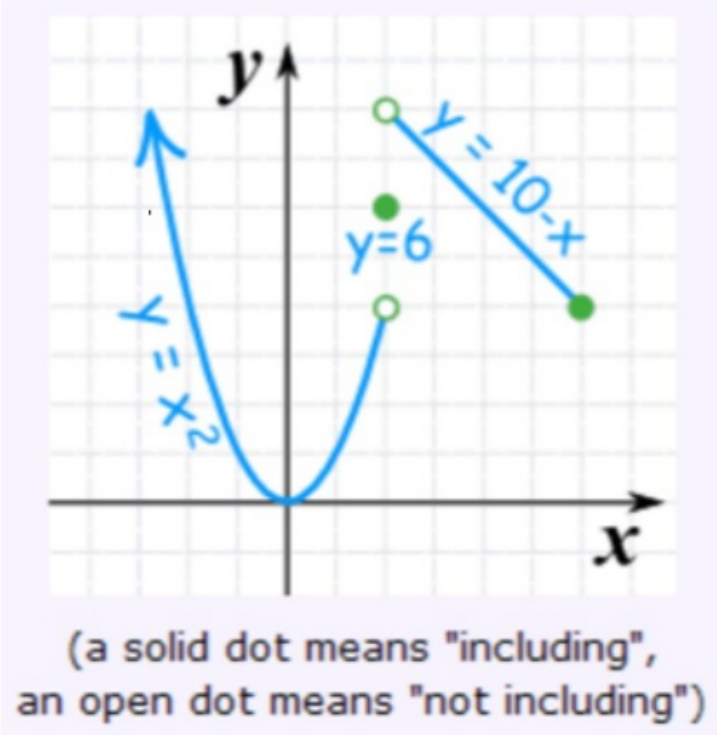


Why?

Piecewise functions are used to represent data in many different fields in the real world, such as in businesses & government agencies.

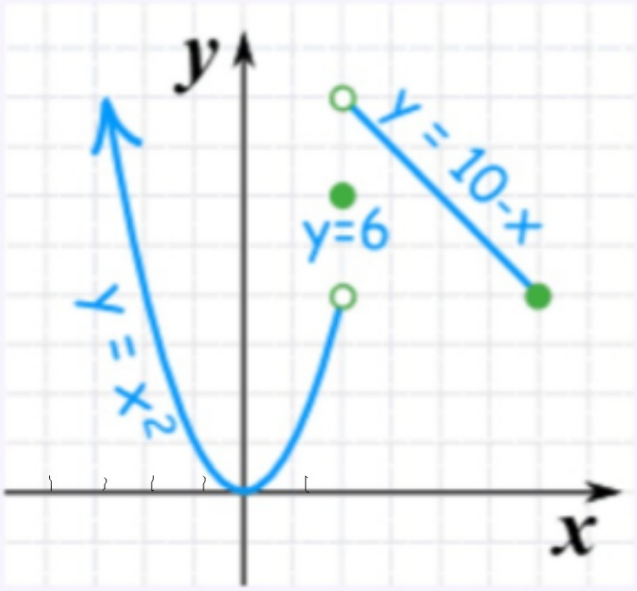
1.5 Piecewise Functions

Piecewise function: a function that is made of 2 or more equations. The domain (x values) tells you which function to use.



(a solid dot means "including", an open dot means "not including")

A piecewise function is like **Frankenstein**!

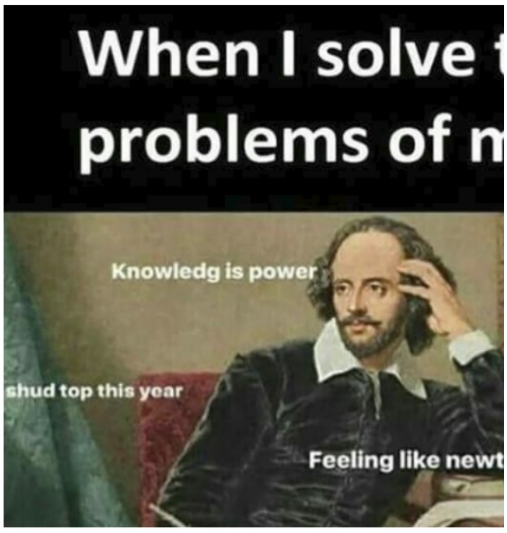


(a solid dot means "including",
an open dot means "not including")

How might you write a function equation for the graph below?

Evaluating Piecewise Functions

$$f(x)=\begin{cases}5-2x, & x<0\\ 5, & 0\le x<1\\ 4x+1, & x\ge 1\end{cases}$$



a. f(-2)

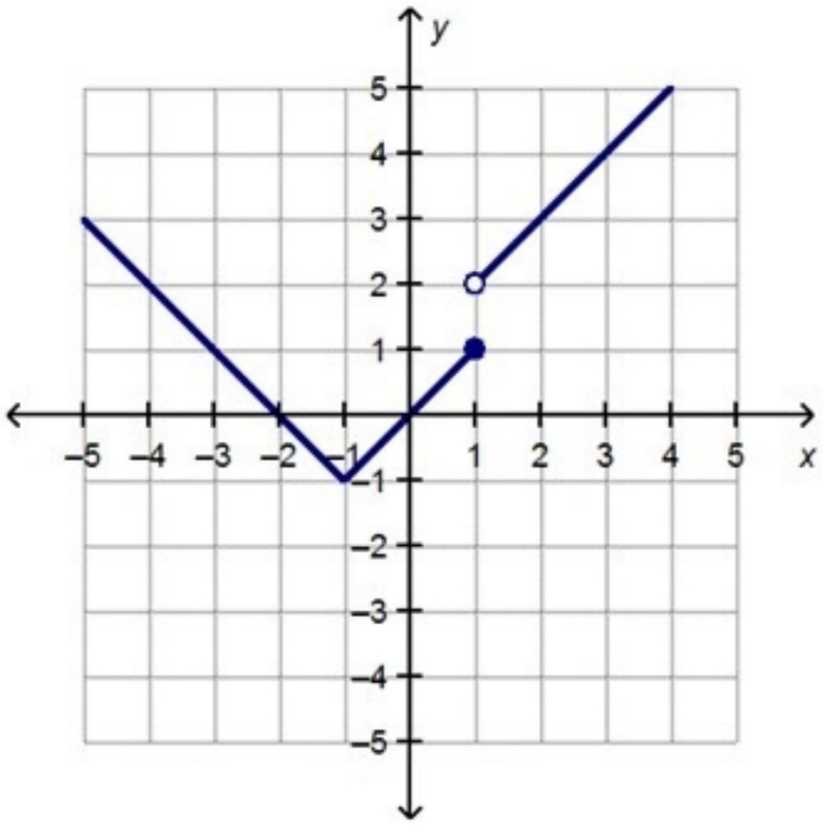
b. f(0.5)

c. f(1)

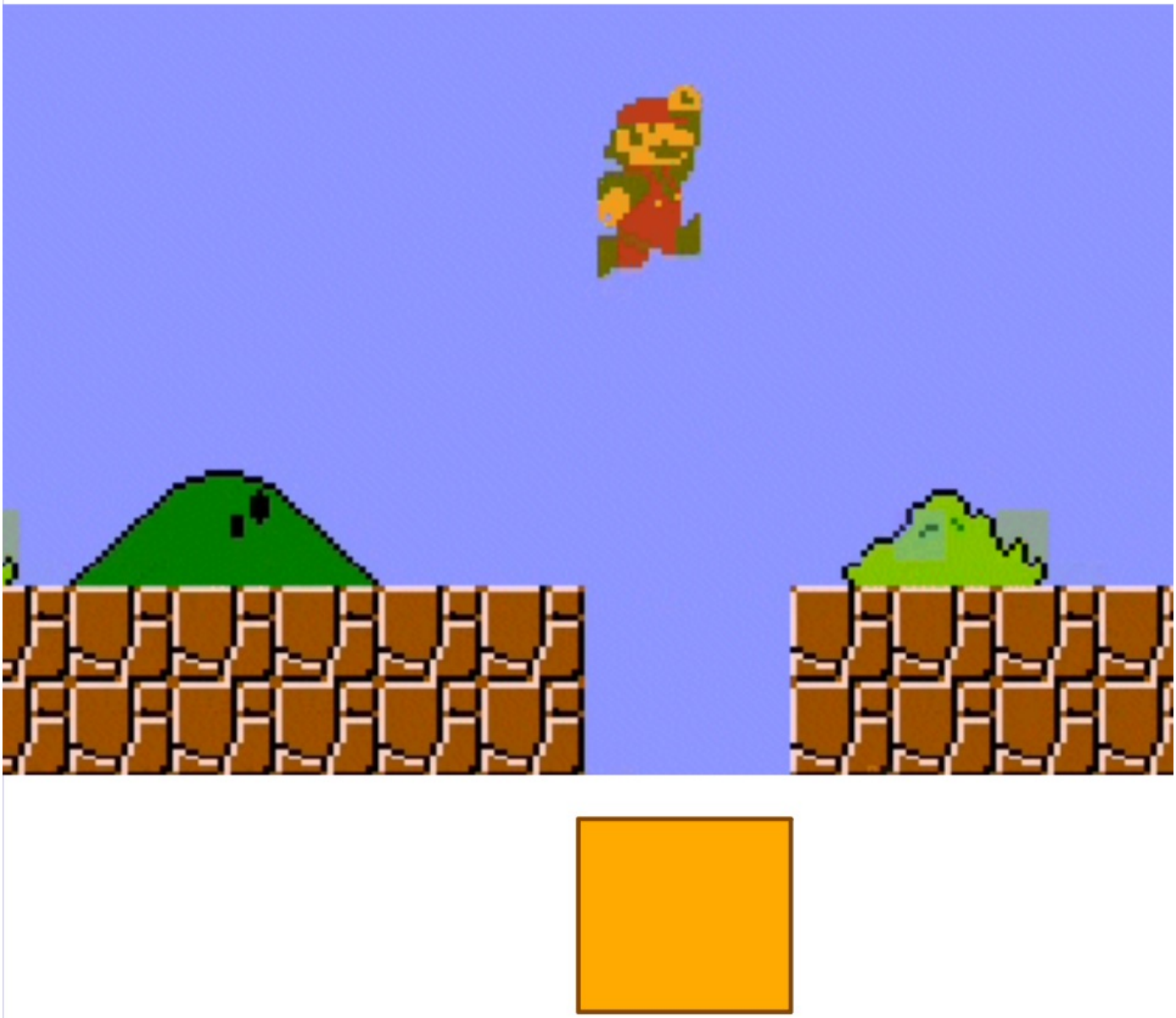
d. f(4)

e. f(-6)

Graphing Piecewise Functions



aking something continuous...



Making a Piecewise Function continuous

Is there a value of k that will make the following piecewise function **continuous** at x = 3?

$$f(x) = \begin{cases} k\sqrt{x+1}, & 0 \le x \le 3 \\ 5 - x, & 3 < x \le 5 \end{cases}$$

What value of *k* will make f(x) continuous?

a. $f(x) = \begin{cases} 4x - 11, x < 3 \\ kx^2, \quad x \geq 3 \end{cases}$

b. $f(x) = \begin{cases} kx^2, & x \leq 2 \\ 2x + k, & x > 2 \end{cases}$

Objective 1.5: I can evaluate and define piecewise functions

Piecewise Function Practice

P-I-G

Complete all the problems!

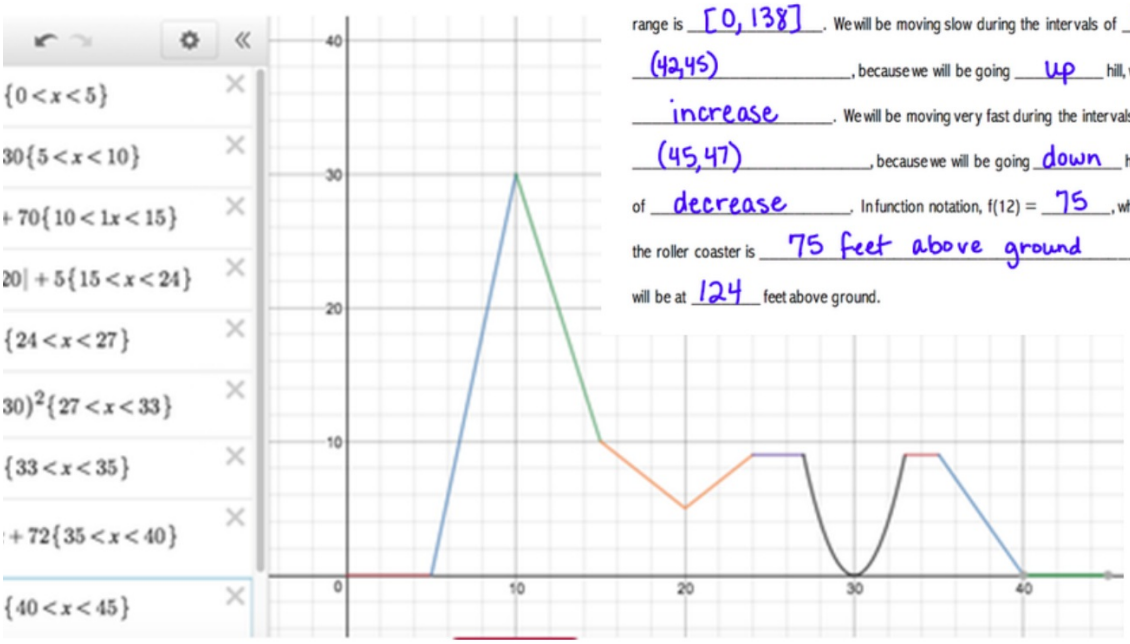
Ask 3 before Me!

Roller Coaster Project

Name/Group: _____

PART C: Analyze – Let's Go for a Ride!!!

Let's go for a ride on the Back Destroyer roller coaster, which is 50 seconds long. The roller coaster begins at 0 feet above ground. After 28 seconds we will reach the maximum height of 138 feet. Therefore, the values for the domain of this roller coaster is [0, 50] and the range is [0, 138]. We will be moving slow during the intervals of (5,10), (20,28), (42,45), because we will be going up hill, which means these are the intervals of increase. We will be moving very fast during the intervals of (10,15), (28,37), (45,47), because we will be going down hill, which means these are the intervals of decrease. In function notation, f(12) = 75, which means at 12 seconds, the roller coaster is 75 feet above ground. After 24 seconds has passed, we will be at 124 feet above ground.



$$K^2 - 5K = 6$$

$$K^2 - 5K - 6 = 0$$

$$(K+1)(K-6) = 0$$

-1 $\quad$ $+6$