SAS1 - Topic 3 | Question 7

Linear	Exponential	Quadratic
Constant Addition.	Constant Mulitplication.	When x increases by a constant amount, the second difference in y is constant.
When x increases by a constant amount, y increases by a constant amount too.	When x increases by a constant amount, the first difference in y is exponential.	After a transformation, the second difference will still be constant but may be a different value.
After a transformation the rate of change will still be a constant but may change to a different value.	After a transformation, the first difference will still be exponential but may change to a different value.	

Interpret the graph first

The graph is showing a skateboarders distance from a motion sensor as a function of time.

What does each point on the graph represent?

A specific distance from the motion sensor for a given time.

What is the graph showing about the skateboarders movements?

The skateboarder starts a given distance from the motion sensor moves toward the sensor at a constant rate then moves away from the sensor at the same rate.

What Parent Function could be used to fit the graph?

Absolute Value Function

What translations are applied to the parent function to get the skateboarders graph?

The Parent Function must move right 4 and up 2 to match the skateboarders graph.

How do the rates of change compare for the two graphs?

The rate of change (slope) of the Parent Function is 1 and the rate of change of the skateboarder is about 2/3 which means that the skateboarder is moving "slower" than the Parent Function.

What transformation needs to be applied to the parent function to match the rate of change for the skateboarders graph?

A Vertical Shrink will make the skateboarder's graph "flatter".

Agilemind website- Topic 3 - Overview-page 5

This summarizes the Overview and previews what is coming up.

Use this given situation:
You drop a rubber ball from a given height. Picture what happens until the ball stops bouncing.
Think about what the graph of the ball's motion would look like.

the ball will hit the ground and bounce up but not as high as it was before. This will continue until the ball eventually comes to rest on the ground.

1. What is the independent variable? Time

2. What could the dependent variable be? height

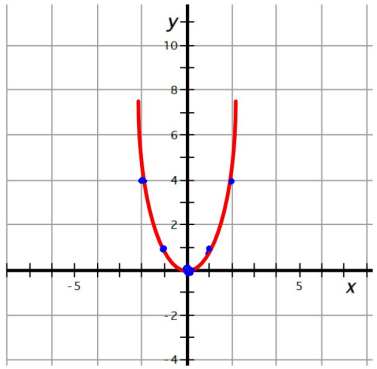
What shape might represent a single bounce of the ball?

An upsidedown parabola.

Topic 3: Transforming Functions

Answer Q #1 on SAS2

Parent Quadratic Function: $y = x^2$



X	Y
1	1
-1	1
2	4
3	9

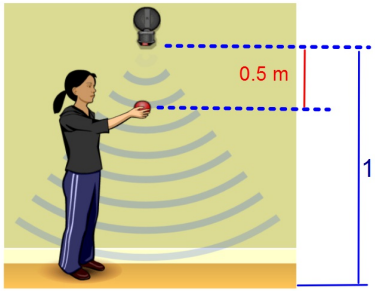
Agilemind website- Topic 3 - Exploring-page 1

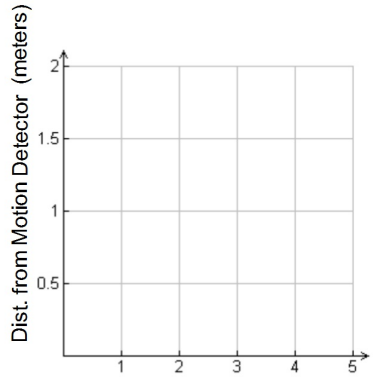
Topic 3: Transforming Functions

Answer Q #2 on SAS2

The motion detector is 1.5m above the floor.
The ball will be dropped from a height that is 0.5m below the height of the motion detector.

Intial Setup





Where is its initial position on the graph?

Agilemind website- Topic 3 - Exploring-page 1

play animation

Agilemind website- Topic 3 - Exploring-page 2

Topic 3: Transforming Functions

Answer Q #3 on SAS2

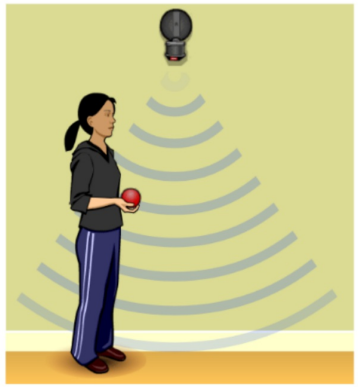
The graph shows the balls distance from the motion sensor over time.

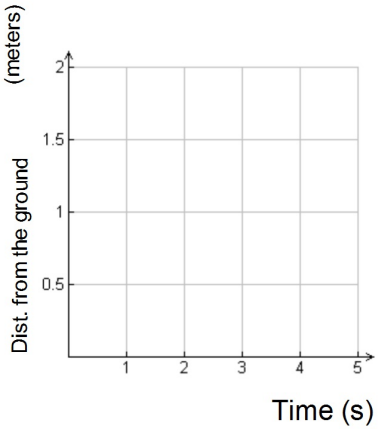
As the ball bounces its height decreases which means its distance from the sensor increases.

It gets closer to its final resting position on the floor, which is a fixed distance from the motion sensor (1.5 meters away).

Topic 3: Transforming Functions

Answer Q #4 on SAS2





Agilemind website- Topic 3 - Exploring-page 2

click on check

How are the points on the new graph related to the points on the old graph?

Points on the new graph are transformations of points on the old graph.

What series of steps could you take to "change" the old graph into the new graph?

Reflect over the x-axis and translate upwards

Hwk #13

SAS2 - Topic 3 - Transforming Functions

Problems 5-7