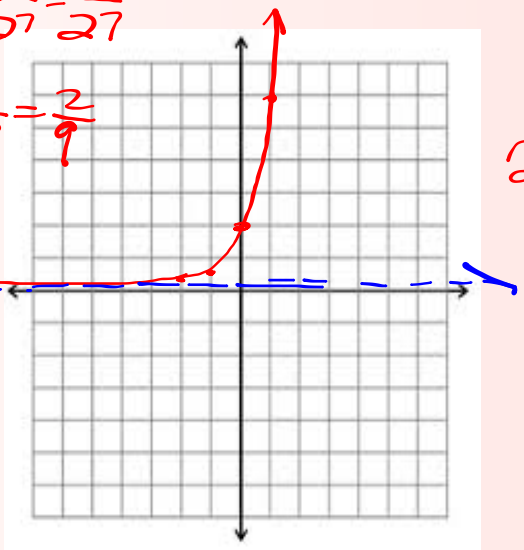
Warm Up:

Fill in the table and sketch the graph of $y = 2(3)^x$

x	y
-2	$2(3)^{-2} = 2 \cdot \frac{1}{3^2} = 2 \cdot \frac{1}{9} = \frac{2}{9}$
-1	$2(3)^{-1} = 2 \cdot \frac{1}{3^1} = 2 \cdot \frac{1}{3} = \frac{2}{3}$
0	$2(3)^0 = 2 \cdot 1 = 2$
1	$2 \cdot 3^1 = 6$
2	$2 \cdot 3^2 = 2 \cdot 9 = 18$
3	$2 \cdot 3^3 = 54$

-3 $2 \cdot 3^{-3} = 2 \cdot \frac{1}{3^3} = 2 \cdot \frac{1}{27} = \frac{2}{27}$



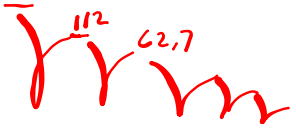
$2(3)^{1/2}$

Should graph be continous or discrete?

Core Problems 5-21, 28, 29 from yesterday.

Let Rebound Ratio = 0.56

a) sketch:



5-29. A MODEL FOR MANY BOUNCES

Imagine that you drop the ball you used in problem 5-19 from a height of 200 cm, but this time you let it bounce repeatedly.

a. As a team, discuss this situation. Then sketch a picture showing what this situation would look like. Your sketch should show a minimum of 6 bounces after you release the ball.

b. Predict your ball's rebound height after each successive bounce if its starting height is 200 cm. Create a table with these predicted heights.

b)

Bounce Number	Rebound Ht.
0	200
1	200(.56) = 112
2	112(.56) = 62.72
3	62.72(.56) = 35.12
4	19.7
5	11.0
6	6.2
7	3.5
8	1.9
9	1.1
10	.6

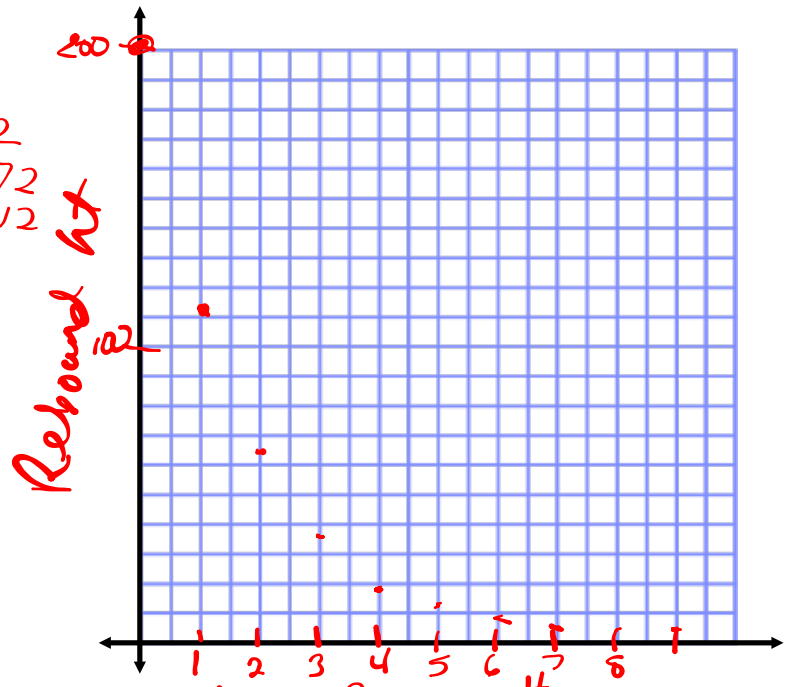
c. What are the independent and dependent variables in this situation?

d. Graph your predicted rebound heights.

e. Should the points on your graph be connected? How can you tell?

b)

x Bounce Number	y Rebound Ht.
0	200
1	200(.56) = 112
2	112 (.56) = 62.72
3	62.72 (.56) = 35.12
4	19.7
5	11.0
6	6.2
7	3.5
8	1.9
9	1.1
10	.6



what is equation?

should we connect?

$y = 200(.56)^x$ $y = 200(.56)^x$

Give graphers. Together, Class Problem on grapher.

Let rebound ratio = 0.45

Fill in the table:

bounce # x	rebound ht in cm
0	200
1	90
2	40.5
3	18.2
4	8.2
5	3.7
6	1.7
7	.7
8	.3

.7 ↓ 47

What is equation?

$y = 200(.45)^x$

Set Grapher Window:

Domain: $-10 \le x \le 10$

Range: $-10 \le y \le 250$

x scale? 1

y scale? 10

Enter data into lists:

STAT EDIT x ---> L_1

y ---> L_2

Create a Scatter Plot: 2nd Y =

Show sketch of your graph:

If you weren't told what the rebound ratio was, but you were given the table, could you find the rebound ratio?

HW: 5- 34 ---> 39

Review & Preview

5-34. DeShawna and her team gathered data for their ball and recorded it in the table shown at right.

Drop Height	Rebound Height
150 cm	124 cm
70 cm	59 cm
120 cm	100 cm
100 cm	83 cm
110 cm	92 cm
40 cm	33 cm

a. What is the rebound ratio for their ball?

b. Predict how high DeShawna's ball will rebound if it is dropped from 275 cm. Look at the precision of DeShawna's measurements in the table. Round your calculation to a reasonable number of decimal places.

c. Suppose the ball is dropped and you notice that its rebound height is 60 cm. From what height was the ball dropped? Use an appropriate precision for your answer.

d. Suppose the ball is dropped from a window 200 meters up the Empire State Building. What would you predict the rebound height to be after the first bounce?

e. How high would the ball in part (d) rebound after the second bounce? After the third bounce?

5-35. Look back at the data given in problem 5-18 that describes the rebound ratio for an official tennis ball. Suppose you drop such a tennis ball from an initial height of 10 feet.

a. How high would it rebound after the first bounce?

b. How high would it rebound after the second bounce?

c. How high would it rebound after the fifth bounce?

5-36. Solve the following systems of equations algebraically and then confirm your solutions by graphing.

a. $y = 3x - 2$
$4x + 2y = 6$

b. $x = y - 4$
$2x - y = -5$

5-37. Lona received a stamp collection from her grandmother. The collection is in a leather book and currently has 120 stamps. Lona joined a stamp club, which sends her 12 new stamps each month. The stamp book holds a maximum of 500 stamps.

a. Complete the table at right.

Month	Stamps
0	120
1	132
2	
3	
4	
5	

b. How many stamps will Lona have in one year from now?

c. Write an equation using function notation to represent the total number of stamps that Lona has in her collection after n months. Let the total be represented by $t(n)$.

d. Solve your equation from part (c) for n when $t(n) = 500$. Will Lona be able to fill her book exactly with no stamps remaining? How do you know? When will the book be filled?

5-38. Use slope to determine whether the points $A(3, 5)$, $B(-2, 6)$, and $C(-5, 7)$ are on the same line. Justify your conclusion algebraically.

5-39. Serena wanted to examine the graphs of the equations below on her graphing calculator. Rewrite each of the equations in ***y*-form** (when the equation is solved for y) so that she can enter them into the calculator.

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

b. $5(x + y) = -2$