

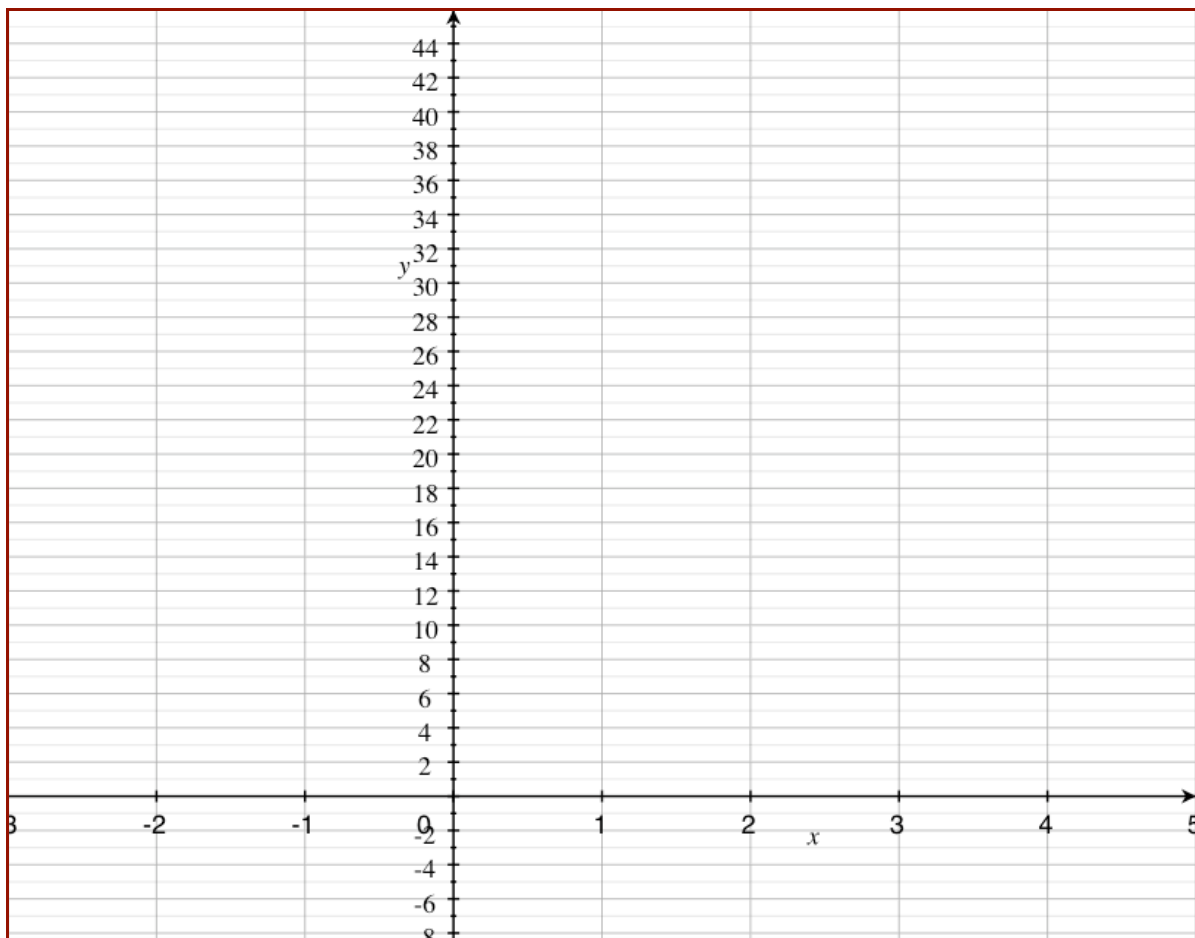
Precalc Warm Up – 10/1/10

Name: _____

Period: _____

- 1) Construct an equation for the following verbal model and sketch a graph:

Mr. Monte-Sano is starting a Math team. On day zero 2 students show up to the meeting. Each of those students invites another two students so that the team doubles in size. Write a function for the number of students on the math team.



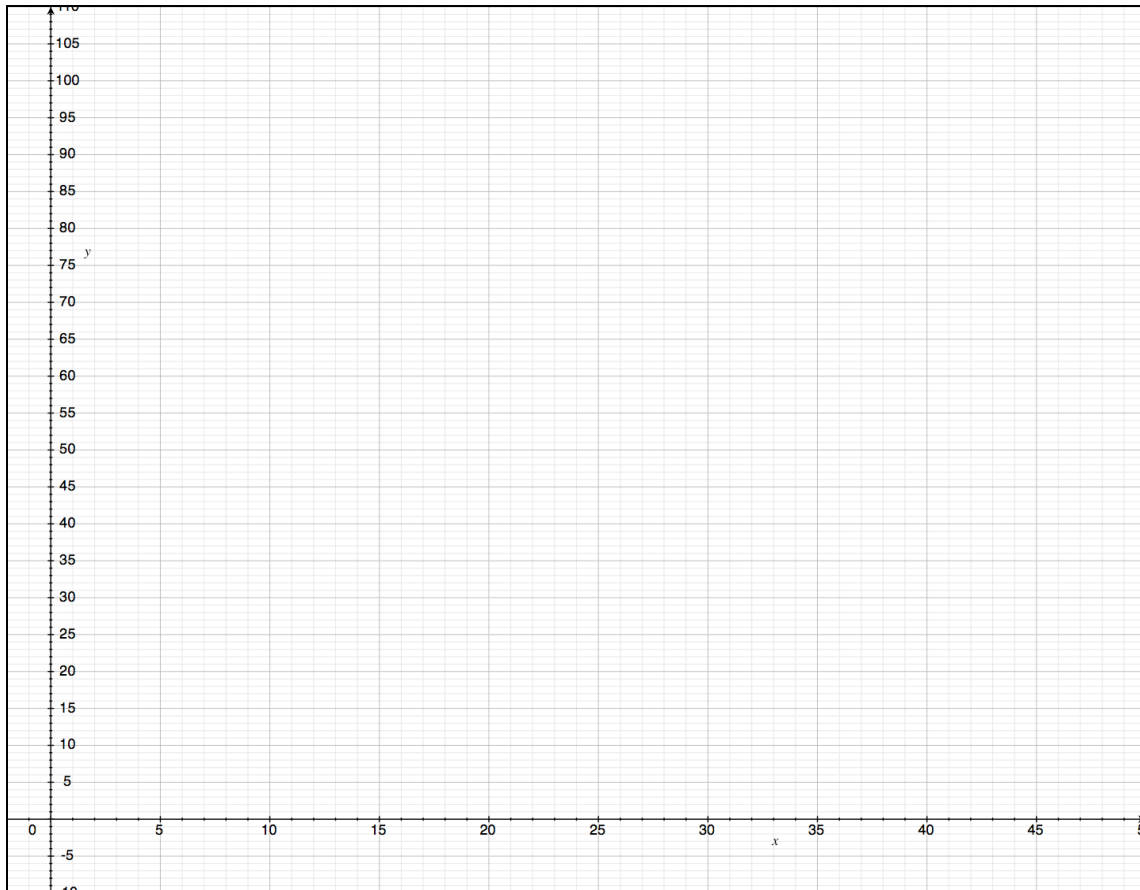
Precalculus – Mr. Leonard's Coffee Problem Solver

Name: _____ Period: _____

Mr. Leonard really, really likes to drink coffee. But, sometimes it gets cold while he teaches and he likes his coffee to be warm. Between classes he puts his cup of coffee into the microwave to heat it up to 100 degrees Fahrenheit and then returns to room 205 with his coffee to teach a 45-minute class.

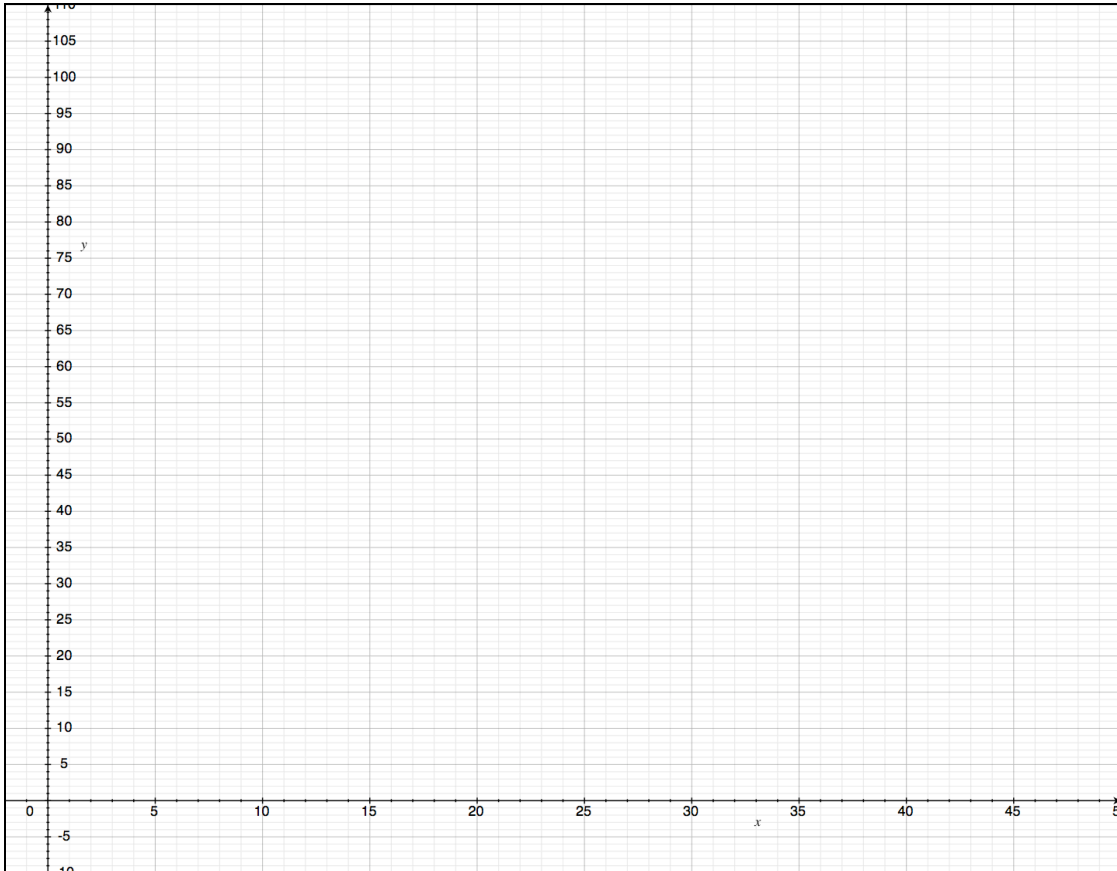
- 1) At time 0 when Mr. Leonard takes the coffee out of the microwave, what temperature is the coffee?
- 2) Does the coffee get warmer or cooler while Mr. Leonard is teaching?
- 3) Will a function of the temperature of his coffee over time be strictly increasing, strictly decreasing or neither?
- 4) Why?
- 5) Will his coffee ever stop getting cooler?

- 6) Assuming that the temperature of the room is set to 70 degrees, sketch a line that could represent the temperature of the coffee over time (temperature should be on the y-axis and time, in minutes, should be on the x-axis).



- 7) Try to construct a function that will represent the cooling of Leonard's coffee.

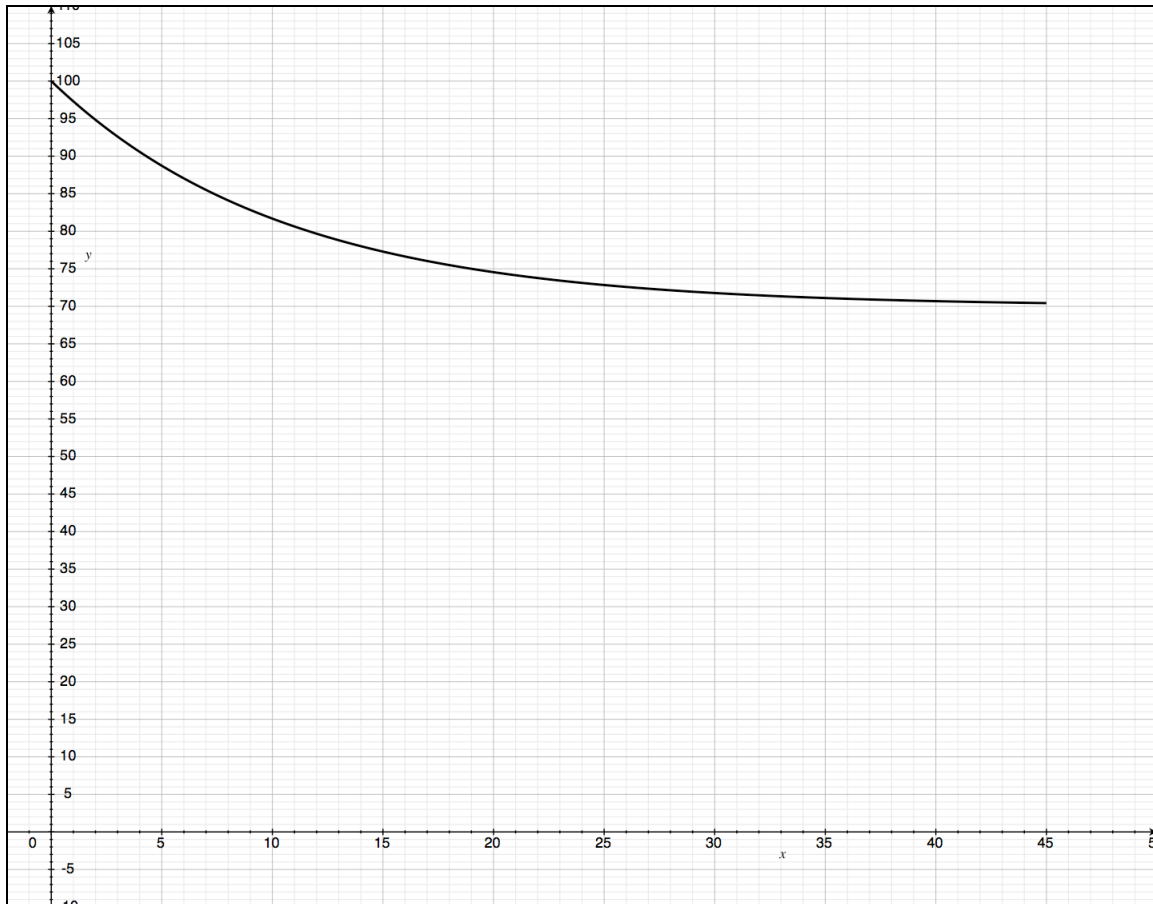
- 8) Now assume that everything is 10 degrees cooler. That is, he only heats his coffee to 90 degrees and the room is set to 60 degrees. Now, Sketch a new line showing what the temperature of Mr. Leonard's coffee is over time.



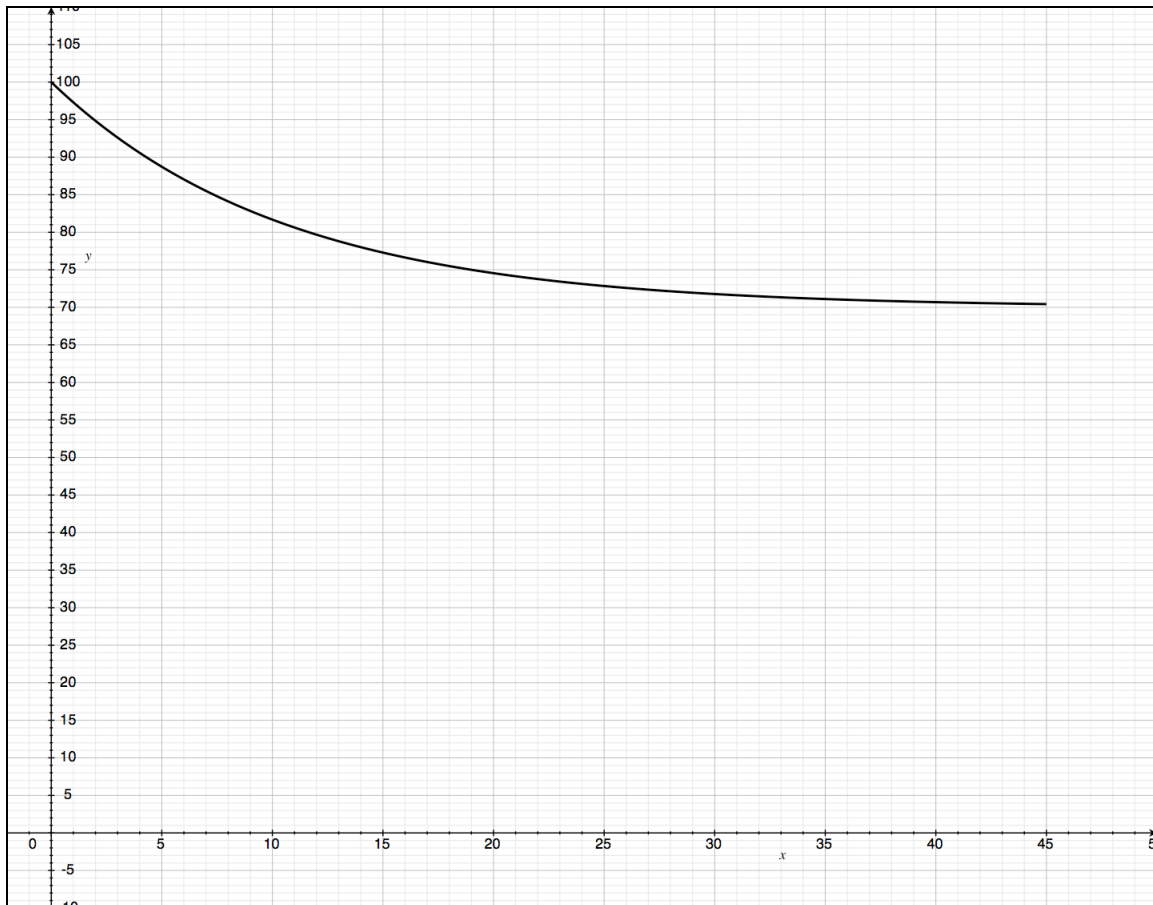
- 9) How has the function from 7) changed? Has the initial value changed? Has the asymptote changed? Has the growth factor changed?

- 10) Try to construct a function that represents the cooling of Leonard's coffee under this new scenario.

- 11) Now, imagine that Leonard is running late. Instead of taking the coffee out of the microwave at $t=0$ (time zero), he takes it out at $t=5$ (5 minutes). Sketch the graph that represents the temperature of Leonard's coffee over time (sketch it on the graph below).



- 12) Use the graph of Leonard's coffee to answer the following questions:
- Is Leonard's coffee an exponential growth or decay function?
 - Is the growth factor greater than one or less than one?
 - What is the average rate of cooling of Leonard's coffee from $t=0$ to $t=45$?
 - What is the average rate of cooling from $t=0$ to 20 ?



Precalc – Exit Slip – 10/1/10

Name: _____

Period: _____

1) The value of a car decreases over time according to an exponential decay function. Imagine that you buy a car for \$30,000. At 15 years the car's value is \$5,000 and after 15 years the value remains at \$5,000. Use the description to answer the following questions:

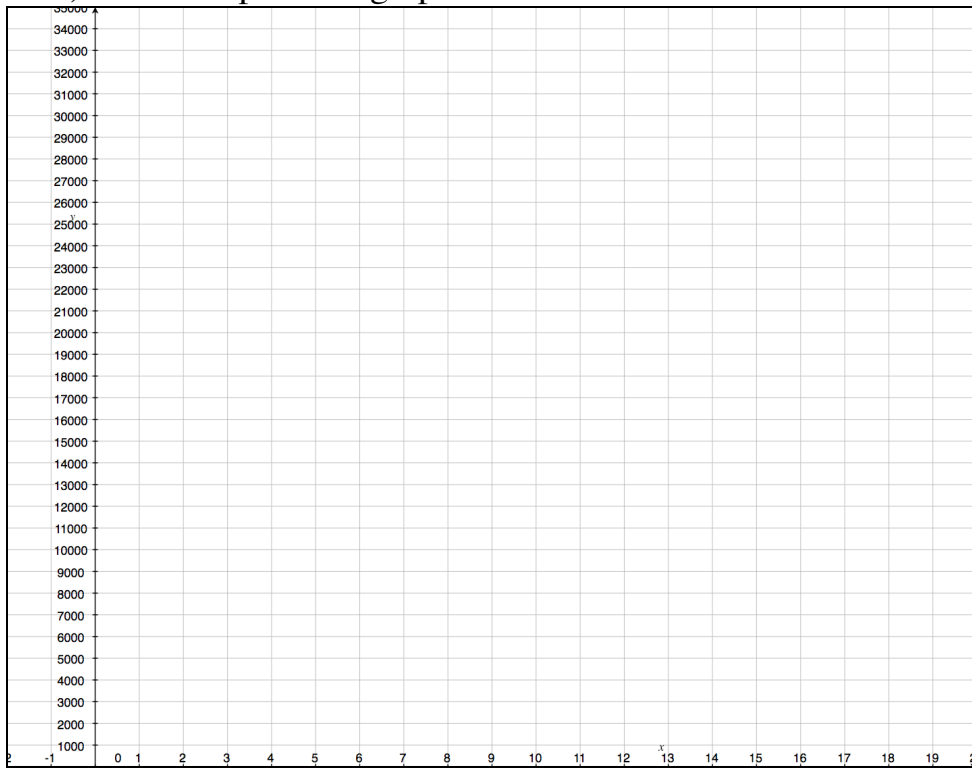
a) Is the value of your car an increasing or decreasing function?

b) Is the growth factor greater or less than one?

c) What is the initial value of the function?

d) What is the asymptote of the function?

e) Sketch a possible graph of the value of the car over time.



2) The value of a house increases over time according to an exponential growth function. Imagine that you buy a house for \$10,000. After 5 years the value of the house doubles.

a) Is the value of your house an increasing or decreasing function?

b) Is the growth factor greater than or less than one?

c) What is the initial value of the function?

d) Sketch a possible graph of the value of the house over time.

