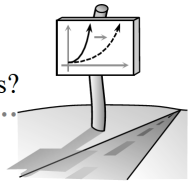
CW#___ Name:_____

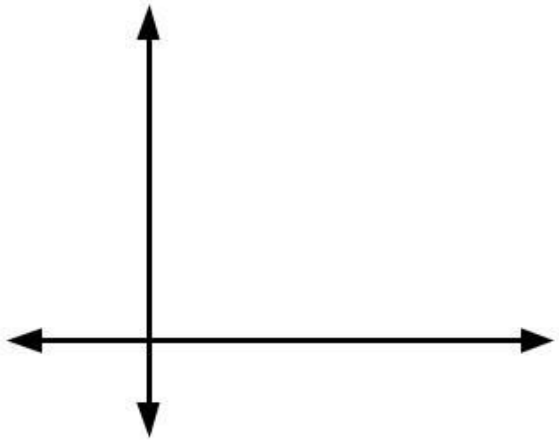
5.1.1 How can I use exponential functions?



Applications of Exponential Functions

#2 Julie has a fresh cup of hot coffee that has a temperature of 180º F. The temperature of the room is 70º F.

a. Sketch a graph of the temperature of the coffee over time.



b. Let t = number of minutes after Julie pours her coffee, and let y = the temperature of the coffee in ºF. Five minutes after Julie pours her coffee, its temperature is 160º F. Write an equation to model this situation.

c. What is the temperature of the coffee 15 minutes after it was poured? Justify your answer using the equation.

#3 An important application of exponential functions lies in calculating the intensity of radiation from radioactive isotopes by using a mathematical model. Most isotopes emit particles and decay into stable forms. The amount of decay of the particles can be described by the isotope's half-life, which is the amount of time it takes half of the isotope to decay. For example, the half-life of Bromine-85 is 3 minutes. If you start with 60 g of Bromine-85, 3 minutes later 30 g will remain. How much Bromine-85 will remain after 20 minutes?

a. Estimate the answer.

b. Use the given information to write an equation that models the situation. (round your b-value/multiplier to the nearest 100th)

c. Use your equation to see how much bromine remains after 20min.