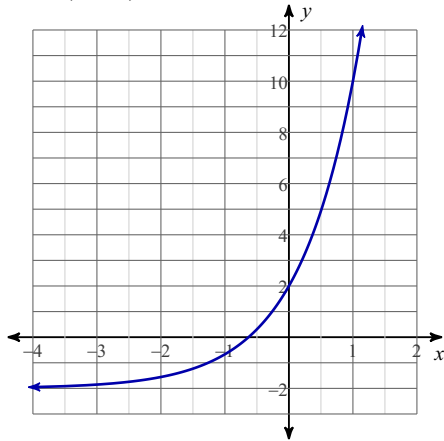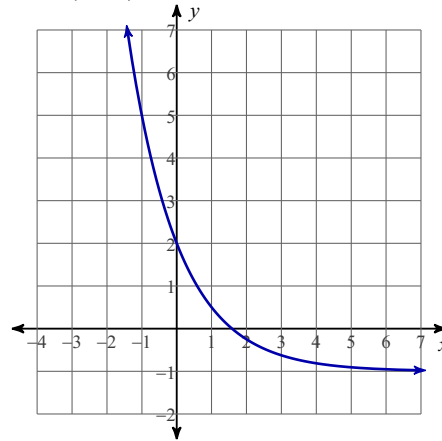# SM3 HW #1-6 (modeling with exponential functions)   Period____

1) What is the equation that has been graphed? The graph passes through (0,2) and (1,10).

2) What is the equation that has been graphed? The graph passes through (0,2) and (-1,5).

3) The equation that models the cooldown of a cup of hot chocolate(temperature in F, and time in minutes) is given by:

$$T(t)=105(0.92^t) + 65$$

a) What is the initial temperature of the hot chocolate? Hint: $T(0) = ?$

b) What is the room temperature?

c) What will be the temperature in 6 minutes?

d) When will the temperature be 90 F ?

4) The equation that models the cooldown of a hot piece of metal put into a water bath (temperature in F, and time in minutes) is given by:

$$T(t)=1500(0.85^t) + 200$$

a) What is the initial temperature of the metal? Hint: $T(0) = ?$

b) What is the temperature of the water bath?

c) what will be the temperature in 6 minutes?

d) When will the temperature be 300 F ?

5) A hot bowl of soupt (at 170 F) is placed on the counter in a room that is at 50 F. In 5 minutes the soup has cooled to 100 F.
   a) Draw the graph the models the cooldown of the soup.
      (1) Label the x, and y-axis with the quantity and unit of measure.
      (2) Show the horizontal asymptote
      (3) Plot the points given in the problem and label their values (two points)

   b) Using the 3-step method we have learned, find the equation that models this situation.

   c) Using your equation, what will the temperature be 10 minutes after starting to cool?
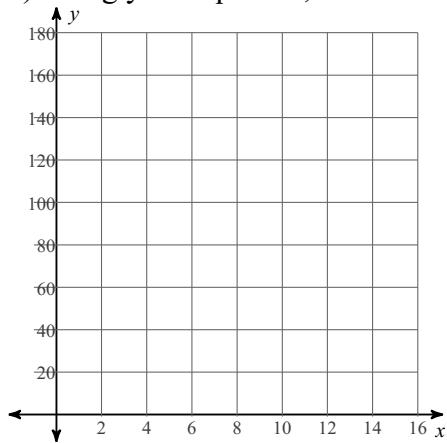
6) A hot piece of metal has been taken out of a furnace (at 900 F) and placed in an oil bath that is 200 F. In 6 minutes the metal has cooled to 400 F.
   a) Draw the graph the models the cooldown of the soup.
      (1) Label the x, and y-axis with the quantity and unit of measure.
      (2) Show the horizontal asymptote
      (3) Plot the points given in the problem and label their values (two points)

   b) Using the 3-step method we have learned, find the equation that models this situation.

   c) What will be the temperature 9 minutes after being placed in the oil bath?