

9. [10 points] Hugo LeBlanc is baking bread. Suppose that  $t$  minutes after he put his bread in the oven, the temperature of the bread in degrees Fahrenheit is

$$y = B(t) = 350 - 290e^{-\frac{t}{7}}.$$

- a. [2 points] Find the temperature of the bread when it is first put into the oven. Include units.

The temperature of the bread when it is first put into the oven is 60° F.

- b. [2 points] Find  $\lim_{t \rightarrow \infty} B(t)$ .

$$\lim_{t \rightarrow \infty} B(t) = \underline{350}.$$

- c. [6 points]  $B(t)$  is a transformation of the function  $e^t$ . Fill in the following blanks with the transformations needed to transform the graph of  $e^t$  into the graph of  $B(t)$ . On each line use one of the phrases given below for the first blank and a number for the second blank, if applicable (for reflections, do not use the second blank). Be sure to list the transformations in the proper order. Leave any unused lines blank.

SHIFT IT HORIZONTALLY TO THE RIGHT	SHIFT IT HORIZONTALLY TO THE LEFT	SHIFT IT VERTICALLY UPWARDS	SHIFT IT VERTICALLY DOWNWARDS	REFLECT IT OVER THE $y$ -AXIS
COMPRESS IT HORIZONTALLY	STRETCH IT HORIZONTALLY	COMPRESS IT VERTICALLY	STRETCH IT VERTICALLY	REFLECT IT OVER THE $t$ -AXIS

To get the graph of  $B(t)$  starting with the graph of  $e^t$ ,

first, we reflect it over the  $t$ -axis by \_\_\_\_\_,

and then we reflect it over the  $y$ -axis by \_\_\_\_\_,

and then we stretch it horizontally by 7,

and then we stretch it vertically by 290.

and then we shift it vertically upwards by 350.