

2. [8 points] In the year 2000, the population of the town of Ashford was 3 thousand people. By 2009, it had grown to 7 thousand.

For parts **a.** and **b.** below, show any needed work and give numerical values exactly or rounded to at least three decimal places.

- a.** [2 points] Assuming that the population of Ashford, in thousands, is a linear function  $L(t)$  of  $t$ , the number of years since 2000, write a formula for  $L(t)$ .

$$L(t) = \underline{\hspace{4cm}}$$

- b.** [3 points] Now, instead, assuming that the population of Ashford, in thousands, is an exponential function  $E(t)$  of  $t$ , the number of years since 2000, write a formula for  $E(t)$ .

$$E(t) = \underline{\hspace{4cm}}$$

The population of a neighboring town, Beaumont, has increased by 3% each year since 2000.

- c.** [3 points] Completely fill in the circle corresponding to the **one** best description of the function  $P(t)$  that gives the population of Beaumont, in thousands, as a function of  $t$ , the number of years since 2000.

- ☐  $P(t)$  is linear because it has a slope of 0.03.
- ☐  $P(t)$  is linear because the population increases at a constant 3% rate.
- ☐  $P(t)$  is exponential because it increases by 30 people each year on average.
- ☐  $P(t)$  is exponential because it has a constant growth factor of 1.03.
- ☐ There is not enough information to determine whether  $P(t)$  is linear or exponential.