Exercise 49

In 1991, the moose population in a park was measured to be 4,360. By 1999, the population was measured again to be 5,880. Assume the population continues to change linearly.

(a) Find a formula for the moose population, P since 1990.

(b) What does your model predict the moose population to be in 2003?

[TYPO: There should be a comma after "P."]

Solution

Let t be the number of years after 1990. Use the two given points, $(1, 4360)$ and $(9, 5880)$, to determine the equation of the line. Find the slope first.

$$m = \frac{P_2 - P_1}{t_2 - t_1} = \frac{5880 - 4360}{9 - 1} = \frac{1520}{8} = 190$$

Then use the point-slope formula with either of the two points to obtain the equation of the line.

$$P - 4360 = 190(t - 1)$$

$$P - 4360 = 190t - 190$$

$$P = 190t + 4170$$

The moose population in 2003 is

$$P = 190(13) + 4170 = 6640.$$