

## Exercise 32

For the following exercises, consider this scenario: The population of a city increased steadily over a ten-year span. The following ordered pairs shows the population (in hundreds) and the year over the ten-year span, (population, year) for specific recorded years:

$$(4,500, 2000); (4,700, 2001); (5,200, 2003); (5,800, 2006)$$

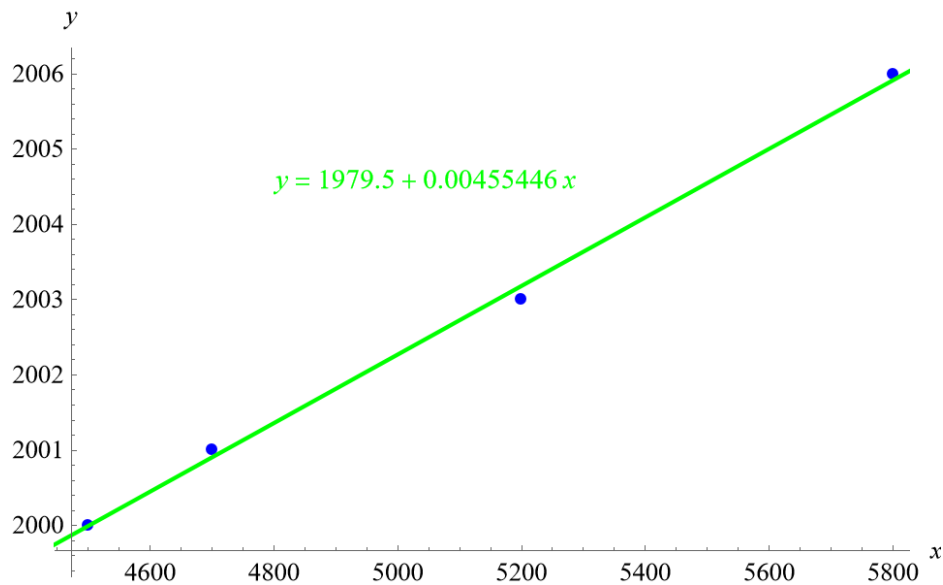
Predict when the population will hit 20,000.

[TYPO: Replace “shows” with “show.”]

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### Solution

Draw the following points on a graph: (4500, 2000), (4700, 2001), (5200, 2003), (5800, 2006).



Mathematica's FindFit function gives

$$y = 1979.500 + 0.00455x$$

as the line that best fits the data. Plug in  $x = 20\,000$  to get the corresponding  $y$ -value.

$$y = 1979.500 + 0.00455(20\,000) \approx 2070.59$$

Therefore, in the middle of 2070 the population will hit 20,000.