

## Exercise 26

The number of people afflicted with the common cold in the winter months dropped steadily by 50 each year since 2004 until 2010. In 2004, 875 people were afflicted.

Find the linear function that models the number of people afflicted with the common cold  $C$  as a function of the year,  $t$ . When will no one be afflicted?

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### Solution

Since the number of people with a cold drops steadily, a linear function can be used to model the number of people with a cold. Let  $t$  be the number of years after 2004.

$$y = mt + b$$

$m$  is the slope, or the rate that the number of people with colds increases.

$$y = -50t + b$$

$b$  is the  $y$ -intercept, the number of people in 2004 that have colds.

$$y = -50t + 875$$

To determine when no one will be afflicted, set  $y = 0$  and solve the equation for  $t$ .

$$0 = -50t + 875$$

$$50t = 875$$

$$t = \frac{875}{50} = 17.5$$

Therefore, there will be no people with colds in the middle of 2021.