

## Average Rate of Change

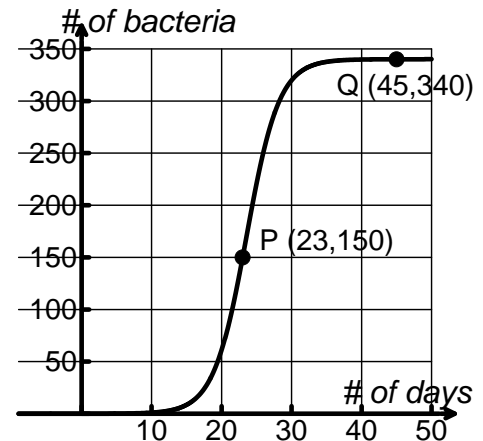
p. 140 - 145 (2.6)

# 2

The average rate of change of a function over an interval is:

1.  $\frac{\text{amount of change}}{\text{length of interval}} = \frac{\Delta y}{\Delta x} = \frac{dy}{dx}$
2. Slope of the secant line through 2 points.
3.  $\frac{f(b) - f(a)}{b - a}$  for  $[a, b]$

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1. In an experiment of population of bacteria, find the average rate of change from  $P$  to  $Q$  and draw in the secant line.



- \*\* (FR, calc.)
2. Traffic flow  $F(t)$  is defined as the rate at which cars pass through an intersection, measured in cars per minute and  $t$  is in minutes. The traffic flow at an intersection is modeled by the function  $F$  defined by  $F\left(t\right) = 82 + 4\sin\left(\frac{t}{2}\right)$  for  $0 \leq t \leq 30$ . What is the average rate of change of the traffic flow over the time interval  $10 \leq t \leq 15$ ? Indicate units of measure.

3. Using the table below, a) estimate  $f'(1870)$  and b) interpret the meaning of your answer.

$t$ (yr)	1850	1860	1870	1880
$f(t)$ (millions)	23.1	31.4	38.6	50.2