Precalculus

Topic: Average Rate of Change of a Function

Instructions

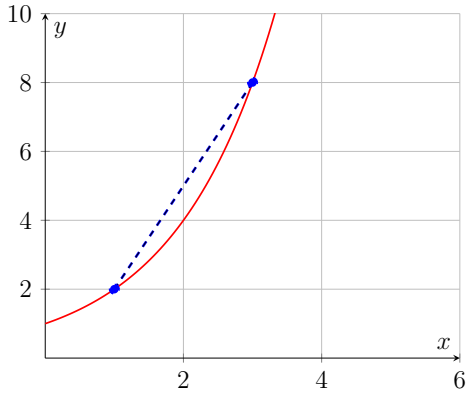
Answer the following problems.

Practice Problems

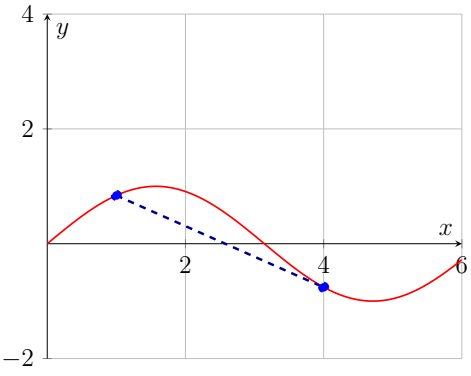
1. Given $f(x) = 2x + 5$, find the average rate of change over the interval $[0, 3]$.
2. For $f(x) = x^2 - 4x + 7$, calculate the average rate of change over the interval $[2, 5]$.
3. The function $f(x) = \sin(x)$ is given. Find the average rate of change over the interval $\left[0, \frac{\pi}{2}\right]$.
4. If $f(x) = \frac{1}{x}$, determine the average rate of change over the interval $[1, 4]$.
5. For the piecewise function:

$$f(x) = \begin{cases} x^2, & x < 2 \\ 3x - 1, & x \geq 2 \end{cases}$$

   Find the average rate of change over the interval $[1, 3]$.
6. Determine the average rate of change of the function between the indicated points on each graph.



a.



b.

Multiple Choice Questions

1. If $f(x) = 3x + 2$, what is the average rate of change over the interval $[1, 4]$?

   a. 2
   b. 3
   c. 4
   d. 5

2. For $f(x) = x^2$, calculate the average rate of change over the interval $[2, 5]$.

   a. 6
   b. 7
   c. 9
   d. 12

3. The function $f(x) = \sin(x)$ is given. What is the average rate of change over the interval $\left[0, \frac{\pi}{2}\right]$?

   a. 1
   b. $\frac{2}{\pi}$
   c. $\frac{1}{\pi}$
   d. 0

4. For $f(x) = \frac{1}{x}$, determine the average rate of change over the interval $[1, 3]$.

   a. $-\frac{1}{3}$
   b. $-\frac{1}{2}$
   c. $\frac{1}{2}$
   d. $\frac{1}{3}$