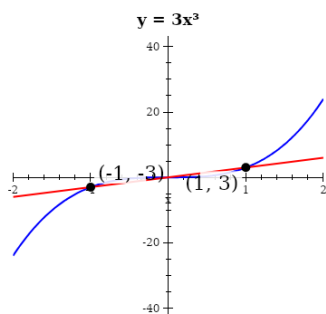




Interpret secant and tangent slopes

- 1** Write the expression for the average rate of change shown by the secant line between the two marked points (1, 3) and (-1, -3).



- | | | | |
|---|-----------------------------|---|-----------------------------|
| A | $\frac{(-1) - 1}{(-3) - 3}$ | B | $\frac{(-3) - 3}{1 - (-1)}$ |
| C | $\frac{(-3) - 3}{(-1) - 1}$ | D | $\frac{3 - (-3)}{(-1) - 1}$ |

- 4** Write the expression for the average rate of change of this function from this point over an interval of width h.

$$f(x) = 2x^2$$

$$f(-1) = 2$$

$$f(-1 + h) = 2(-1 + h)^2$$

- | | | | |
|---|-----------------------------|---|------------------------------|
| A | $\frac{h}{2(-1 + h)^2 - 2}$ | B | $\frac{2(-1 + h)^2 - 2}{-1}$ |
| C | $\frac{2 - 2(-1 + h)^2}{h}$ | D | $\frac{2(-1 + h)^2 - 2}{h}$ |

- 2** Write the expression for the average rate of change of this function between the two points.

$$f(x) = \sin\left(\frac{\pi x}{4}\right)$$

$$f(-2) = -1$$

$$f(0) = 0$$

- | | | | |
|---|-----------------------------|---|-----------------------------|
| A | $\frac{(-1) - 0}{0 - (-2)}$ | B | $\frac{0 - (-2)}{0 - (-1)}$ |
| C | $\frac{0 - (-1)}{0 - (-2)}$ | D | $\frac{0 - (-1)}{(-2) - 0}$ |

- 3** Write the expression for the average rate of change of this function between the two x-values.

$$f(x) = x^3$$

$$f(1) = ?$$

$$f(3) = ?$$

- | | | | |
|---|------------------------|---|------------------------|
| A | $\frac{3 - 1}{27 - 1}$ | B | $\frac{27 - 1}{3 - 1}$ |
| C | $\frac{27 - 1}{1 - 3}$ | D | $\frac{1 - 27}{3 - 1}$ |

- 5** Find the average rate of change of this function from this point over an interval of width h.

$$\begin{aligned} f(x) &= x + 1 \\ f(1) &= 2 \\ f(1 + h) &= (1 + h) + 1 \end{aligned}$$

- | | | | |
|---|---------|---|-----|
| A | $1h$ | B | 2 |
| C | $1 + h$ | D | 1 |

- 6** Find the average rate of change of this function from this x-value over an interval of width h.

$$\begin{aligned} f(x) &= 3x^2 \\ f(0) &= 0 \\ f(0 + h) &= 3h^2 \end{aligned}$$

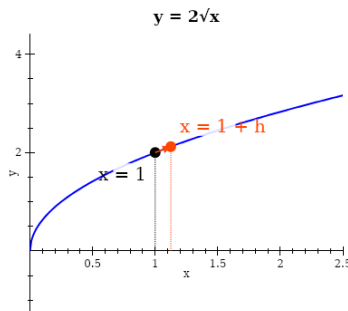
- | | | | |
|---|----------|---|----------|
| A | 0 | B | $0 - 3h$ |
| C | $0 + 3h$ | | |



Interpret secant and tangent slopes

7

Write the simplified difference quotient for the tangent slope of this function as h approaches 0.



A

$$\lim_{h \rightarrow 0} \left(\frac{2}{2\sqrt{x}} \right)$$

B

$$\lim_{h \rightarrow 0} \left(\frac{2}{\sqrt{x+h} + \sqrt{h}} \right)$$

C

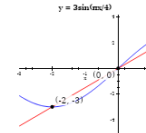
$$\lim_{h \rightarrow 0} \left(\frac{2}{\sqrt{x+h} + \sqrt{x}} \right)$$

D

$$\lim_{h \rightarrow 0} \left(\frac{2}{\sqrt{x+h} - \sqrt{x}} \right)$$

8

Find the average rate of change shown by the secant line between the two marked points $(0, 0)$ and $(-2, -3)$.



A 1.5

B 0.7

C -1.5

D 2.1

E -3

9

Find the average rate of change of this function between the two points.

$$f(x) = 2x$$

$$f(2) = 4$$

$$f(3) = 6$$

A

0.5

B

-2

C

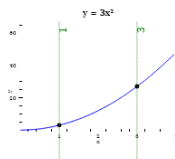
2

D

1.3

10

Find the average rate of change between the two highlighted x -values $x=1$ and $x=3$.



A 0.1

B 12

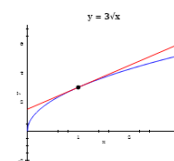
C 12.4

D 24

E -12

11

Estimate the instantaneous rate of change (the slope of the tangent line) at the marked point. Note: the y -axis may not be the same scale as the x -axis.



A about 1.5

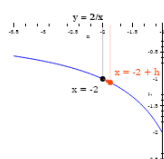
B about -0.5

C about 0.5

D about -1

12

Estimate the instantaneous rate of change at the marked point by adding a second point very near to it. Note: the y -axis may not be the same scale as the x -axis.



A about 1

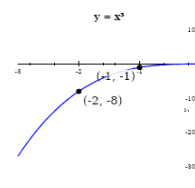
B about -0.5

C about 1.5

D about 0.5

13

Find the average rate of change between the two marked points $(-1, -1)$ and $(-2, -8)$.



A 7.2

B -7

C 7

D 0.1