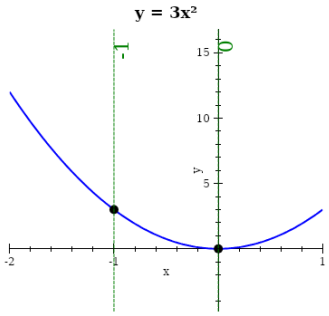
Name

Relate limits to instantaneous rate of change

1

Write the expression for the average rate of change between the two highlighted x-values x=0 and x=-1.



A $\frac{0-3}{(-1)-0}$

B $\frac{3-0}{0-(-1)}$

C $\frac{3-0}{(-1)-0}$

D $\frac{(-1)-0}{3-0}$

2

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

$f(x)=3\cos\left(\frac{\pi x}{4}\right)$

$f(0)=3$

$f(-2)=0$

A $\frac{0-3}{(-2)-0}$

B $\frac{0-3}{0-(-2)}$

C $\frac{3-0}{(-2)-0}$

D $\frac{(-2)-0}{0-3}$

3

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

$f(x)=3\sqrt{x}$

$f(2)=4.2$

$f(2+h)=3\sqrt{2+h}$

A $\frac{h}{3\sqrt{2+h}-4.2}$

B $\frac{4.2-3\sqrt{2+h}}{h}$

C $\frac{3\sqrt{2+h}-4.2}{h}$

D $\frac{3\sqrt{2+h}-4.2}{2}$

4

Write the expression for the average rate of change of this function from this x-value over an interval of width h.

$f(x)=2x-1$

$f(1)=?$

$f(1+h)=?$

A $\frac{2(1+h)-1-1}{h}$

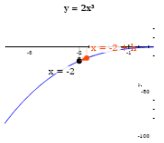
B $\frac{2(1+h)-1-1}{1}$

C $\frac{h}{2(1+h)-1-1}$

D $\frac{1-2(1+h)-1}{h}$

5

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 -0.5

B about 0.5

C about 1

D about 24

Name

Relate limits to instantaneous rate of change

6

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

$$f(x) = 2\sqrt{x}$$
$$f(2) = 2.8$$
$$f(2+h) = 2\sqrt{2+h}$$

A $\dfrac{2}{\sqrt{2+h}+\sqrt{2}}$

B $\dfrac{2}{2\sqrt{2}}$

C $\dfrac{2}{\sqrt{2+h}-\sqrt{2}}$

D $\dfrac{2}{\sqrt{2+h}}$

7

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

$$f(x) = 3x^3$$
$$f(1) = ?$$
$$f(1+h) = ?$$

A $9+9h-3h^2$

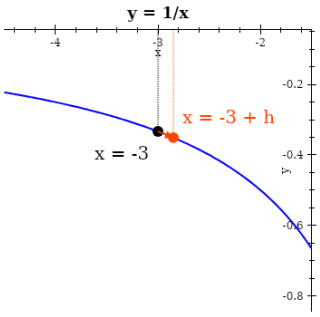
B $9+9h+3h^2$

C $9+9h$

D $9+3h$

8

Set up the slope (difference quotient) of this function between the marked point and the nearby point at x + h.



A $\dfrac{\frac{1}{-3+h}+\frac{1}{(-3)}}{(-3+h)-(-3)}$

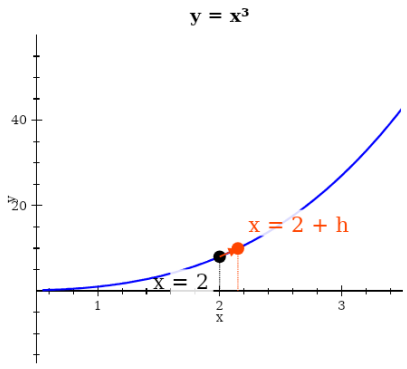
B $\dfrac{(-3+h)-(-3)}{\frac{1}{-3+h}-\frac{1}{(-3)}}$

C $\dfrac{\frac{1}{(-3)}-\frac{1}{-3+h}}{(-3+h)-(-3)}$

D $\dfrac{\frac{1}{-3+h}-\frac{1}{(-3)}}{(-3+h)-(-3)}$

9

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



A $\lim_{h\to 0}(3x^2+3xh)$

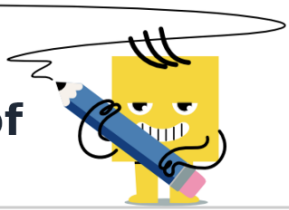
B $\lim_{h\to 0}(3x^2+3xh+hh^2)$

C $\lim_{h\to 0}(x^2+3xh+hh^2)$

D $\lim_{h\to 0}(3x^2+hxh+hh^2)$

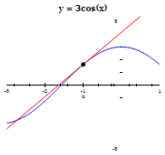
Name

Relate limits to instantaneous rate of change



10

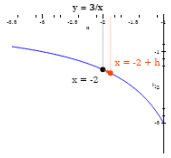
Estimate the instantaneous rate of change (the slope of the tangent line) at the marked point. Note: the y-axis may not be the same scale as the x-axis.



A about 1 | B about -0.5 | C about 3 | D about 0.5

11

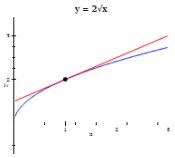
Estimate the instantaneous rate of change at the marked point by adding a second point very near to it. Note: the y-axis may not be the same scale as the x-axis.



A about 0.5 | B about 1 | C about 1.5 | D about -0.8

12

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 | B about 1 | C about 0.5 | D about -0.5