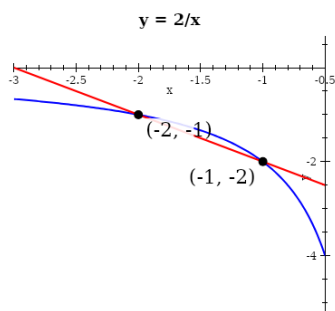


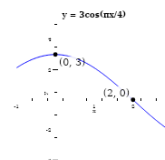
Estimate instantaneous rate of change numerically

- 1** Write the expression for the average rate of change shown by the secant line between the two marked points $(-1, -2)$ and $(-2, -1)$.



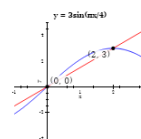
- A $\frac{(-2) - (-1)}{(-2) - (-1)}$
- B $\frac{(-1) - (-2)}{(-2) - (-1)}$
- C $\frac{(-1) - (-2)}{(-1) - (-2)}$

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



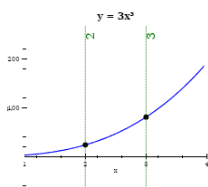
- A -0.7 B 1.5 C -3
- D -1.5 E 0.9

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



- A 0 B 1.5 C -1.5
- D 0.7 E -3

- 4** Find the average rate of change between the two highlighted x-values $x=2$ and $x=3$.



- A 0 B 55.4 C 57 D -57

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

$$f(x) = 2x^3$$

$$f(2) = 16$$

$$f(1) = 2$$

- A $\frac{1 - 2}{2 - 16}$
- B $\frac{16 - 2}{1 - 2}$
- C $\frac{2 - 16}{1 - 2}$
- D $\frac{2 - 16}{2 - 1}$

- 6** Find the average rate of change of this function between the two x-values.

$$f(x) = \frac{2}{x}$$

$$f(-1) = ?$$

$$f(-2) = ?$$

- A 1 B 0.8
- C -1 D -0.8

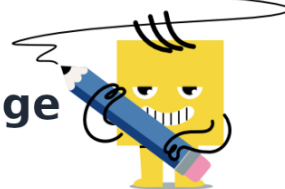
- 7** Find the average rate of change of this function from this point over an interval of width h .

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

$$f(2) = 8$$

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

- A 8 B $8 + 2h$
- C $4 + 2h$ D $8 - 2h$



Estimate instantaneous rate of change numerically

8

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

$$f(x) = 2x^3$$

$$f(1) = 2$$

$$f(1+h) = 2(1+h)^3$$

A

$$\frac{2 - 2(1+h)^3}{h}$$

B

$$\frac{h}{2(1+h)^3 - 2}$$

C

$$\frac{2(1+h)^3 - 2}{h}$$

D

$$\frac{2(1+h)^3 - 2}{1}$$

9

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

$$f(x) = 2x^3$$

$$f(-2) = ?$$

$$f(-2+h) = ?$$

A

$$24 - 12h$$

B

$$24 - 12h - 2h^2$$

C

$$24 - 12h + 2h^2$$

D

$$24 + 2h$$

10

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

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

$$f(-2) = ?$$

$$f(-2+h) = ?$$

A

$$\frac{4 - (-2+h)^2}{h}$$

B

$$\frac{h}{(-2+h)^2 - 4}$$

C

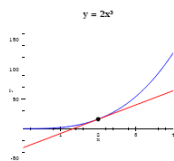
$$\frac{(-2+h)^2 - 4}{-2}$$

D

$$\frac{(-2+h)^2 - 4}{h}$$

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 24

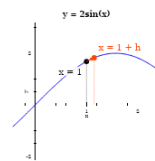
B about 1

C about -0.5

D about 0.5

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 0.5

B about 1.1

C about -0.5

D about -1