Calculus Practice: Instantaneous Rate of Change 1a

For each problem, find the instantaneous rate of change of the function at the given value.

1) $y = x^2 - 2x + 1;\ \ 2$

A) 0 B) $-\frac{1}{2}$

C) 4 D) 2

2) $f(x) = x^2 + 2x + 2;\ \ -2$

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

C) −2 D) 8

3) $y = -2x^2 + x + 1;\ \ 0$

A) −2 B) 1

C) $\frac{1}{4}$ D) $-\frac{1}{2}$

4) $y = 2x^2 + 1;\ \ 0$

A) $\frac{1}{3}$ B) 4

C) −3 D) 0

5) $y = -\frac{1}{x-1};\ \ -2$

A) $\frac{1}{3}$ B) $-\frac{1}{3}$

C) $\frac{4}{9}$ D) $\frac{1}{9}$

6) $y = \frac{1}{x+2};\ \ -1$

A) −1 B) $\frac{1}{3}$

C) $\frac{1}{4}$ D) $\frac{1}{2}$

7) $y = \frac{1}{x-2};\ \ -2$

A) $-\frac{1}{64}$ B) $-\frac{3}{16}$

C) $-\frac{1}{16}$ D) $\frac{1}{4}$

8) $y = -\frac{1}{x+3};\ \ -1$

A) $\frac{1}{4}$ B) $-\frac{1}{2}$

C) 0 D) $\frac{1}{2}$

For each problem, find the equation of the tangent line to the function at the given point.

9) $f(x) = x^2 + 1;\ (1, 2)$

A) $y = 2x$

B) $y = -8x + 10$

C) $y = \frac{1}{2}x + \frac{3}{2}$

D) $y = -6x + 8$

10) $f(x) = 2x^2 + 2x + 2;\ (-1, 2)$

A) $y = -8x - 6$

B) $y = -2x$

C) $y = \frac{1}{2}x + \frac{5}{2}$

D) $y = 6x + 8$

11) $y = x^2 + x - 2;\ (1, 0)$

A) $y = \frac{3}{4}x - \frac{3}{4}$

B) $y = -\frac{3}{2}x + \frac{3}{2}$

C) $y = 3x - 3$

D) $y = -12x + 12$

12) $y = 2x^2 + 1;\ (-1, 3)$

A) $y = 2x + 5$

B) $y = -4x - 1$

C) $y = 12x + 15$

D) $y = x + 4$

13) $f(x) = \frac{1}{x + 1};\ (0, 1)$

A) $y = \frac{1}{4}x + 1$

B) $y = -2x + 1$

C) $y = -x + 1$

D) $y = 1$

14) $f(x) = -\frac{1}{x};\ \left(2, -\frac{1}{2}\right)$

A) $y = -\frac{3}{4}x + 1$

B) $y = \frac{1}{4}x - 1$

C) $y = \frac{3}{4}x - 2$

D) $y = x - \frac{5}{2}$

15) $y = -\frac{1}{x + 3};\ (-2, -1)$

A) $y = -1$

B) $y = x + 1$

C) $y = -\frac{1}{2}x - 2$

D) $y = 4x + 7$

16) $f(x) = \frac{1}{x - 1};\ \left(-1, -\frac{1}{2}\right)$

A) $y = -\frac{1}{4}x - \frac{3}{4}$

B) $y = -\frac{1}{12}x - \frac{7}{12}$

C) $y = \frac{1}{12}x - \frac{5}{12}$

D) $y = -x - \frac{3}{2}$

Calculus Practice: Instantaneous Rate of Change 1a

For each problem, find the instantaneous rate of change of the function at the given value.

1) $y = x^2 - 2x + 1;\ \ 2$

A) 0 B) $-\frac{1}{2}$

C) 4 *D) 2

2) $f(x) = x^2 + 2x + 2;\ \ -2$

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

*C) −2 D) 8

3) $y = -2x^2 + x + 1;\ \ 0$

A) −2 *B) 1

C) $\frac{1}{4}$ D) $-\frac{1}{2}$

4) $y = 2x^2 + 1;\ \ 0$

A) $\frac{1}{3}$ B) 4

C) −3 *D) 0

5) $y = -\frac{1}{x-1};\ \ -2$

A) $\frac{1}{3}$ B) $-\frac{1}{3}$

C) $\frac{4}{9}$ *D) $\frac{1}{9}$

6) $y = \frac{1}{x+2};\ \ -1$

*A) −1 B) $\frac{1}{3}$

C) $\frac{1}{4}$ D) $\frac{1}{2}$

7) $y = \frac{1}{x-2};\ \ -2$

A) $-\frac{1}{64}$ B) $-\frac{3}{16}$

*C) $-\frac{1}{16}$ D) $\frac{1}{4}$

8) $y = -\frac{1}{x+3};\ \ -1$

*A) $\frac{1}{4}$ B) $-\frac{1}{2}$

C) 0 D) $\frac{1}{2}$

For each problem, find the equation of the tangent line to the function at the given point.

9) $f(x) = x^2 + 1;\ (1, 2)$

*A) $y = 2x$

B) $y = -8x + 10$

C) $y = \frac{1}{2}x + \frac{3}{2}$

D) $y = -6x + 8$

10) $f(x) = 2x^2 + 2x + 2;\ (-1, 2)$

A) $y = -8x - 6$

*B) $y = -2x$

C) $y = \frac{1}{2}x + \frac{5}{2}$

D) $y = 6x + 8$

11) $y = x^2 + x - 2;\ (1, 0)$

A) $y = \frac{3}{4}x - \frac{3}{4}$

B) $y = -\frac{3}{2}x + \frac{3}{2}$

*C) $y = 3x - 3$

D) $y = -12x + 12$

12) $y = 2x^2 + 1;\ (-1, 3)$

A) $y = 2x + 5$

*B) $y = -4x - 1$

C) $y = 12x + 15$

D) $y = x + 4$

13) $f(x) = \frac{1}{x + 1};\ (0, 1)$

A) $y = \frac{1}{4}x + 1$

B) $y = -2x + 1$

*C) $y = -x + 1$

D) $y = 1$

14) $f(x) = -\frac{1}{x};\ \left(2, -\frac{1}{2}\right)$

A) $y = -\frac{3}{4}x + 1$

*B) $y = \frac{1}{4}x - 1$

C) $y = \frac{3}{4}x - 2$

D) $y = x - \frac{5}{2}$

15) $y = -\frac{1}{x + 3};\ (-2, -1)$

A) $y = -1$

*B) $y = x + 1$

C) $y = -\frac{1}{2}x - 2$

D) $y = 4x + 7$

16) $f(x) = \frac{1}{x - 1};\ \left(-1, -\frac{1}{2}\right)$

*A) $y = -\frac{1}{4}x - \frac{3}{4}$

B) $y = -\frac{1}{12}x - \frac{7}{12}$

C) $y = \frac{1}{12}x - \frac{5}{12}$

D) $y = -x - \frac{3}{2}$