

7.01 Average rate of change

For each problem, find the average rate of change of the function over the given interval.

1) $f(x) = -2x^2 + x - 2; [0, 1]$

2) $f(x) = -2x^2 - 2; [0, 1]$

3) $f(x) = x^2 - x - 1; [-1, 2]$

4) $f(x) = x^2 - 2x + 1; [0, 3]$

5) $f(x) = -2x^2 - 1; [0, 1]$

6) $f(x) = -2x^2 + 2x - 2; [-1, 1]$

7) $f(x) = 2x^2 - x - 2; [1, 2]$

8) $f(x) = -x^2 - x - 1; [-2, -1]$

9) $f(x) = -\frac{1}{x}; [2, 3]$

10) $f(x) = -\frac{1}{x-2}; [-3, 0]$

11) $f(x) = -\frac{1}{x-3}; [-1, 0]$

12) $f(x) = \frac{1}{x-1}; [-4, -3]$

13) $f(x) = -\frac{1}{x+1}; [1, \frac{3}{2}]$

14) $f(x) = -\frac{1}{x-2}; [-3, -\frac{5}{2}]$

15) $f(x) = \frac{1}{x-3}; [-1, -\frac{1}{2}]$

16) $f(x) = -\frac{1}{x-2}; [0, \frac{1}{2}]$

For each problem, find the equation of the secant line that intersects the given points on the function.

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

18) $f(x) = x^2 + 1; (-2, 5), (-1, 2)$

19) $f(x) = 2x^2 - x + 2; (-1, 5), (1, 3)$

20) $f(x) = x^2 - 1; (-1, 0), (0, -1)$

21) $f(x) = -x^2 - 1; (0, -1), (\frac{1}{2}, -\frac{5}{4})$

22) $f(x) = -x^2 - 2x + 2; (0, 2), (\frac{1}{2}, \frac{3}{4})$

23) $f(x) = -x^2 + x + 1; (-1, -1), (-\frac{1}{2}, \frac{1}{4})$

24) $f(x) = -x^2 - 2; (-2, -6), (-\frac{3}{2}, -\frac{17}{4})$

25) $f(x) = \frac{1}{x+2}; (0, \frac{1}{2}), (1, \frac{1}{3})$

26) $f(x) = -\frac{1}{x-2}; (-3, \frac{1}{5}), (0, \frac{1}{2})$

$$27) f(x) = -\frac{1}{x+2}; \left(0, -\frac{1}{2}\right), \left(3, -\frac{1}{5}\right)$$

$$28) f(x) = \frac{1}{x+3}; \left(-1, \frac{1}{2}\right), \left(2, \frac{1}{5}\right)$$

$$29) f(x) = -\frac{1}{x}; (1, -1), \left(\frac{5}{4}, -\frac{4}{5}\right)$$

$$30) f(x) = -\frac{1}{x-1}; \left(-1, \frac{1}{2}\right), \left(-\frac{2}{3}, \frac{3}{5}\right)$$

$$31) f(x) = \frac{1}{x+3}; \left(-1, \frac{1}{2}\right), \left(-\frac{2}{3}, \frac{3}{7}\right)$$

$$32) f(x) = -\frac{1}{x+2}; (-1, -1), \left(-\frac{2}{3}, -\frac{3}{4}\right)$$

Answers to 7.01 Average rate of change (ID: 1)

1) -1

5) -2

9) $\frac{1}{6}$

13) $\frac{1}{5}$

17) $y = -3x + 4$

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

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

29) $y = \frac{4}{5}x - \frac{9}{5}$

2) -2

6) 2

10) $\frac{1}{10}$

14) $\frac{2}{45}$

18) $y = -3x - 1$

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

26) $y = \frac{1}{10}x + \frac{1}{2}$

30) $y = \frac{3}{10}x + \frac{4}{5}$

3) 0

7) 5

11) $\frac{1}{12}$

15) $-\frac{1}{14}$

19) $y = -x + 4$

23) $y = \frac{5}{2}x + \frac{3}{2}$

27) $y = \frac{1}{10}x - \frac{1}{2}$

31) $y = -\frac{3}{14}x + \frac{2}{7}$

4) 1

8) 2

12) $-\frac{1}{20}$

16) $\frac{1}{3}$

20) $y = -x - 1$

24) $y = \frac{7}{2}x + 1$

28) $y = -\frac{1}{10}x + \frac{2}{5}$

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