

Find the average rate of change of the function over the given interval.

1) $y = \frac{3}{x-2}$, [4, 7]

A) 7

B) $-\frac{3}{10}$

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

D) 2

1) _____

Find the slope of the curve for the given value of x.

2) $y = x^2 + 5x$, $x = 2$

A) slope is - 2

B) slope is 13

C) slope is 2

D) slope is 9

2) _____

Find the limit, if it exists.

3) $\lim_{h \rightarrow 0} \frac{15x + h}{x^3(x - h)}$

A) $15x$

B) $\frac{15}{x^4}$

C) Does not exist

D) $\frac{15}{x^3}$

3) _____

4) $\lim_{x \rightarrow -8} \frac{x^2 + 14x + 48}{x + 8}$

A) 14

B) 224

C) -2

D) Does not exist

4) _____

Find the limit.

5) $\lim_{x \rightarrow 0} (5 \sin x - 1)$

A) 5

B) $5 - 1$

C) 0

D) -1

5) _____

Provide an appropriate response.

6) Let $\lim_{x \rightarrow 10} f(x) = 7$ and $\lim_{x \rightarrow 10} g(x) = -6$. Find $\lim_{x \rightarrow 10} [f(x) - g(x)]$.

6) _____

A) 13

B) 10

C) 7

D) 1

Find the limit.

7) If $\lim_{x \rightarrow 2} \frac{f(x)}{x^2} = 4$, find $\lim_{x \rightarrow 2} \frac{f(x)}{x}$.

7) _____

A) 4

B) 2

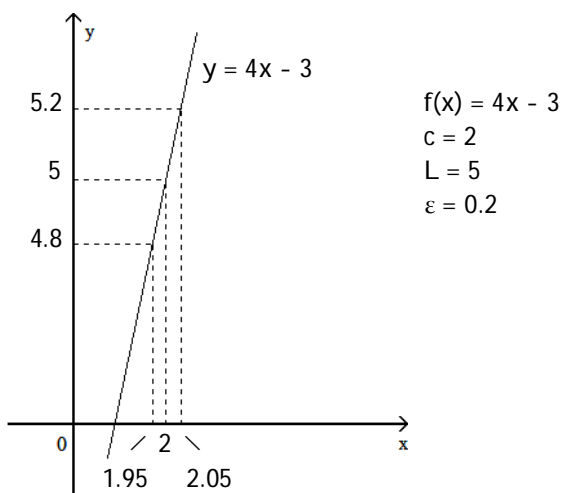
C) 8

D) 16

Use the graph to find a $\delta > 0$ such that for all x , $0 < |x - c| < \delta \Rightarrow |f(x) - L| < \epsilon$.

8)

8) _____



NOT TO SCALE

A) $\delta = 0.1$

B) $\delta = 3$

C) $\delta = 0.05$

D) $\delta = 0.5$

A function $f(x)$, a point c , the limit of $f(x)$ as x approaches c , and a positive number ϵ is given. Find a number $\delta > 0$ such that for all x , $0 < |x - c| < \delta \Rightarrow |f(x) - L| < \epsilon$.

9) $f(x) = -6x + 8$, $L = -4$, $c = 2$, and $\epsilon = 0.01$

A) $\delta = 0.006667$

B) $\delta = -0.005$

C) $\delta = 0.003333$

D) $\delta = 0.001667$

9) _____

Find the limit L for the given function f , the point c , and the positive number ϵ . Then find a number $\delta > 0$ such that, for all x , $0 < |x - c| < \delta \Rightarrow |f(x) - L| < \epsilon$.

10) $f(x) = \frac{6}{x}$, $c = 3$, $\epsilon = 0.3$

A) $L = 2$; $\delta = 5.29$

B) $L = 2$; $\delta = 0.39$

C) $L = 2$; $\delta = 1.06$

D) $L = 2$; $\delta = 0.53$

10) _____

Determine the limit:

11) $\lim_{x \rightarrow -6^+} f(x)$, where $f(x) = \begin{cases} 2x & -6 \leq x < 0, \text{ or } 0 < x \leq 3 \\ 2 & x = 0 \\ 0 & x < -6 \text{ or } x > 3 \end{cases}$

A) -12

B) Does not exist

C) 3

D) -0

11) _____

Find the limit.

$$12) \lim_{h \rightarrow 0^+} \frac{\sqrt{h^2 + 7h + 3} - \sqrt{3}}{h}$$

12) _____

A) $\frac{7}{\sqrt{6}}$

B) $\frac{7}{2\sqrt{3}}$

C) $\frac{7}{6}$

D) Does not exist

Find the limit using $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$.

$$13) \lim_{x \rightarrow 0} \frac{\sin 4x}{\sin 5x}$$

13) _____

A) 0

B) does not exist

C) $\frac{4}{5}$

D) $\frac{5}{4}$

$$14) \lim_{x \rightarrow 0} \frac{x^2 - 2x + \sin x}{x}$$

14) _____

A) does not exist

B) -1

C) 0

D) 1

The limit of the function is given. Determine at which value b, x approaches to :

$$15) \lim_{x \rightarrow b} \frac{1}{x^2 - 9} = \infty$$

15) _____

A) 3

B) 9

C) 3^+

D) 0

Find the intervals on which the function is continuous.

16) $y = \frac{2}{x^2 - 16}$

16) _____

- A) discontinuous only when $x = -4$
- B) discontinuous only when $x = -16$ or $x = 16$
- C) discontinuous only when $x = 16$
- D) discontinuous only when $x = -4$ or $x = 4$

17) $y = \sqrt{4x + 10}$

17) _____

- A) continuous on the interval $\left[-\frac{5}{2}, \infty\right)$
- C) continuous on the interval $\left[-\infty, -\frac{5}{2}\right]$

- B) continuous on the interval $\left[\frac{5}{2}, \infty\right)$
- D) continuous on the interval $\left[-\frac{5}{2}, \infty\right)$

Find numbers a and b, or k, so that f is continuous at every point.

18)

18) _____

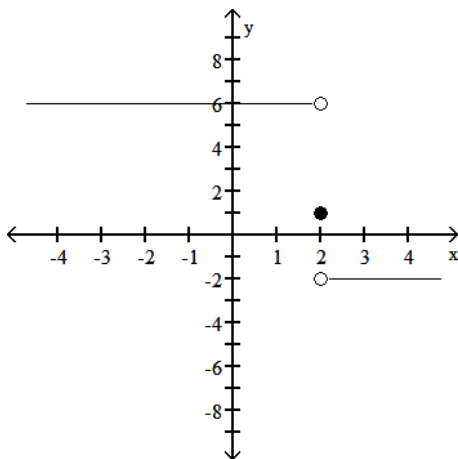
$$f(x) = \begin{cases} x^2, & \text{if } x \leq 6 \\ x + k, & \text{if } x > 6 \end{cases}$$

- A) $k = 42$
- B) $k = 30$
- C) $k = -6$
- D) Impossible

For the function f whose graph is given, determine the limit.

19) Find $\lim_{x \rightarrow 2^-} f(x)$ and $\lim_{x \rightarrow 2^+} f(x)$.

19) _____



- A) 1; 1
- B) -2; 6
- C) 6; -2
- D) does not exist; does not exist

Find the limit.

$$20) \lim_{x \rightarrow -\infty} \frac{-3 + (2/x)}{5 - (1/x^2)}$$

20) _____

A) ∞

B) $\frac{3}{5}$

C) $-\infty$

D) $-\frac{3}{5}$

$$21) \lim_{x \rightarrow \infty} \frac{4x^3 - 4x^2 + 3x}{-x^3 - 2x + 6}$$

21) _____

A) ∞

B) 4

C) -4

D) $\frac{3}{2}$

$$22) \lim_{x \rightarrow -\infty} \frac{\cos 5x}{x}$$

22) _____

A) 5

B) 0

C) 1

D) $-\infty$

Divide numerator and denominator by the highest power of x in the denominator to find the limit.

$$23) \lim_{t \rightarrow \infty} \frac{\sqrt{81t^2 - 729}}{t - 9}$$

23) _____

A) 81

B) 729

C) does not exist

D) 9

Find the limit.

$$24) \lim_{x \rightarrow \infty} (\sqrt{10x^2 + 7} - \sqrt{10x^2 - 3})$$

24) _____

A) $\sqrt{10}$

B) ∞

C) 0

D) $\frac{1}{2\sqrt{10}}$

Find the limit.

$$25) \lim_{x \rightarrow \infty} \frac{-4x^{-1} + 2x^{-3}}{-4x^{-2} + x^{-5}}$$

25) _____

A) 1

B) 0

C) ∞

D) $-\infty$

Select one appropriate way of describing the limit of the function when x approaches ∞ :

$$26) \lim_{x \rightarrow \infty} \frac{x^2 - 7x + 12}{x^3 - 9x}$$

26) _____

A) As x approaches ∞ , the function decreases without bound.

B) As x approaches ∞ , the function increases without bound.

C) As x approaches ∞ , the function approaches 0

D) As x approaches ∞ , the function's limit does not exist.

Answer Key

Testname: REVIEW 01

- 1) B
- 2) D
- 3) D
- 4) C
- 5) D
- 6) A
- 7) C
- 8) C
- 9) D
- 10) B
- 11) A
- 12) B
- 13) C
- 14) B
- 15) C
- 16) D
- 17) A
- 18) B
- 19) C
- 20) D
- 21) C
- 22) B
- 23) D
- 24) C
- 25) C
- 26) C