

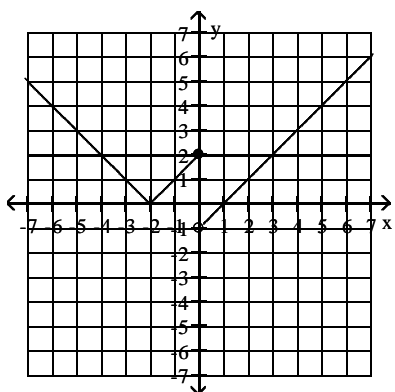
Math 1106 -- Instructor: Bruce Thomas
Fall Semester 2009
Practice Test #1

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Decide whether the limit exists. If it exists, find its value.

1)

1) _____



Find $\lim_{x \rightarrow 0^-} f(x)$ and $\lim_{x \rightarrow 0^+} f(x)$.

$x \rightarrow 0^-$

$x \rightarrow 0^+$

A) -2; -1

B) 2; -1

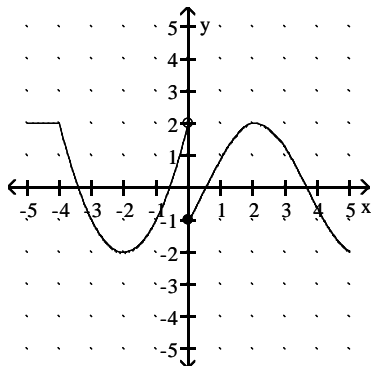
C) 2; 1

D) -1; 2

Determine whether the function shown is continuous over the interval $(-5, 5)$.

2)

2) _____



A) Yes

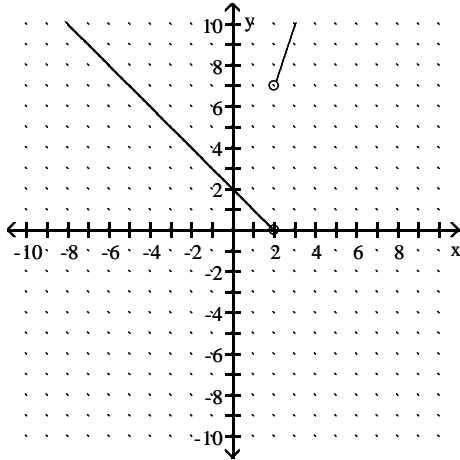
B) No

Graph the function and then find the specified limit. When necessary, state that the limit does not exist.

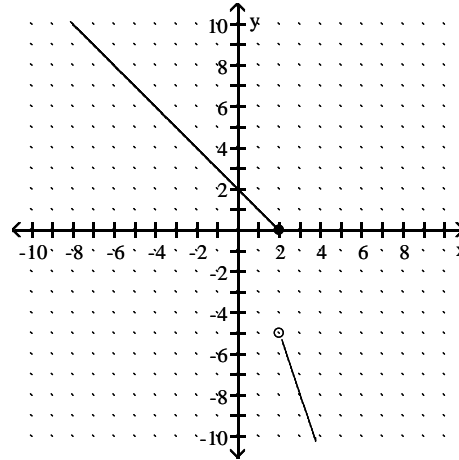
$$3) f(x) = \begin{cases} 2 - x, & x \leq 2 \\ 1 + 3x, & x > 2 \end{cases}; \quad \lim_{x \rightarrow 2^+} f(x)$$

3) _____

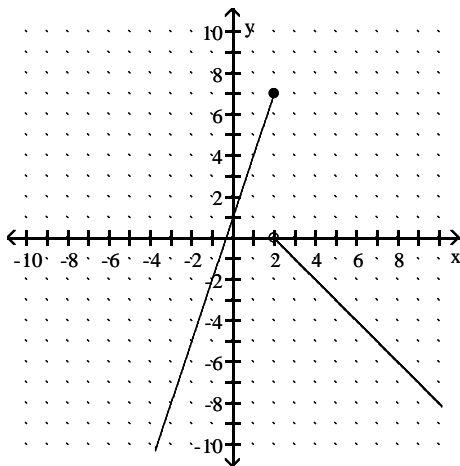
A) $\lim_{x \rightarrow 2^+} f(x) = 7$



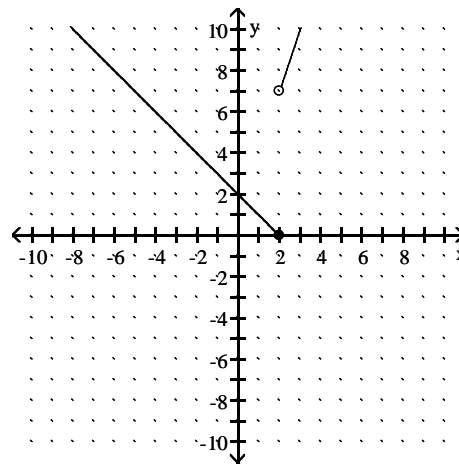
B) $\lim_{x \rightarrow 2^+} f(x) = -5$



C) $\lim_{x \rightarrow 2^+} f(x) = 0$



D) $\lim_{x \rightarrow 2^+} f(x) = 7$



Evaluate or determine that the limit does not exist for each of the limits (a) $\lim_{x \rightarrow 1^-} f(x)$,

(b) $\lim_{x \rightarrow 1^+} f(x)$, and (c) $\lim_{x \rightarrow 1} f(x)$ for the given function f.

4)

$$f(x) = \begin{cases} 7x - 10, & \text{for } x < 1, \\ 1, & \text{for } x = 1, \\ -6x + 4, & \text{for } x > 1 \end{cases}$$

4) _____

A) (a) -2

(b) -3

(c) Does not exist

C) (a) -2

(b) -3

(c) -5

B) (a) -3

(b) -2

(c) -5

D) (a) -3

(b) -2

(c) Does not exist

Find the limit, if it exists.

5) $\lim_{x \rightarrow 2} (x^2 + 8x - 2)$

5) _____

A) 18

C) 0

B) Does not exist

D) -18

6) $\lim_{x \rightarrow -8} \frac{x^2 - 64}{x + 8}$

6) _____

- A) Does not exist
- C) -16

- B) 1
- D) -8

7) $\lim_{x \rightarrow 5} \frac{x^2 + 25}{x + 5}$

7) _____

- A) 5
- C) 10

- B) Does not exist
- D) 0

8) $\lim_{x \rightarrow 3} \sqrt{x^2 + 4x + 4}$

8) _____

- A) ± 5
- C) Does not exist

- B) 25
- D) 5

Find the limit by using the TABLE and TRACE features of your graphing calculator.

9) $\lim_{x \rightarrow 0} \frac{\sqrt{3+3x} - \sqrt{3}}{x}$

9) _____

A) $\frac{\sqrt{3}}{2}$

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

C) 0

D) $\sqrt{3}$

Answer the question.

10) Given $f(x) = x + 6$ and $g(x) = x - 6$, where is the function $f(x)/g(x)$ continuous?

10) _____

A) The function $f(x)/g(x)$ is continuous for all x except $x = -6$ and $x = 6$.

B) The function $f(x)/g(x)$ is continuous for all x .

C) The function $f(x)/g(x)$ is continuous for all x except $x = -6$.

D) The function $f(x)/g(x)$ is continuous for all x except $x = 6$.

Find a simplified difference quotient for the function.

11) $f(x) = 9x^3$

11) _____

A) $27x^2$

B) $27x^2 + 27xh + 9h$

C) $27x^2 + 27xh + 9h^2$

D) $27x^2 + h$

Solve the problem.

12) At the beginning of a trip, the odometer on a car reads 28,312 and the car has a full tank of gas. At the end of the trip the odometer reads 28,604 and there are 2.2 gallons remaining in the tank. The tank can hold a total of 11 gallons. What is the average rate of change of the number of miles with respect to the number of gallons? Assume that the tank was not filled during the trip.

12) _____

A) 26.55 miles/gal

B) 33.18 miles/gal

C) 292 miles

D) 22.12 miles/gal

Find the derivative.

13) $f(x) = 5x^{130}$

A) $f'(x) = 650x^{129}$

C) $f'(x) = 650x^{130}$

B) $f'(x) = 650x^{131}$

D) $f'(x) = 5x^{129}$

13) _____

14) $y = 4 - 3x^2$

A) $\frac{dy}{dx} = 4 - 6x$

B) $\frac{dy}{dx} = 4 - 3x$

C) $\frac{dy}{dx} = -6x$

D) $\frac{dy}{dx} = -6$

14) _____

Find $f'(a)$ for the given value of a .

15) $f(x) = x^4 + 4x^3 + 2x - 2$, $a = -2$

A) -6

B) 18

C) -8

D) 16

15) _____

Find the equation of the line tangent to the graph of the function at the indicated point.

16) $f(x) = x^2 - x$ at $(-3, 12)$

A) $y = -7x - 6$

B) $y = -7x + 6$

C) $y = -7x - 9$

D) $y = -7x + 9$

16) _____

Find all values of x (if any) where the tangent line to the graph of the function is horizontal.

17) $y = x^3 - 3x^2 + 1$

A) 2

B) 0

C) -2, 0, 2

D) 0, 2

17) _____

Find the derivative.

18) $f(x) = 9x^{7/5} - 5x^2 + 10^4$

A) $f'(x) = \frac{63}{5}x^{6/5} - 10x$

B) $f'(x) = \frac{63}{5}x^{2/5} - 10x + 4000$

C) $f'(x) = \frac{63}{5}x^{2/5} - 10x$

D) $f'(x) = \frac{63}{5}x^{6/5} - 10x + 4000$

18) _____

19) $g(x) = 4x^5 + x^4 - 4x^2 + 7$, find $g'(-1)$

A) 4

B) 28

C) 24

D) 16

19) _____

20) $f(x) = \sqrt[5]{x}$

A) $f'(x) = -\frac{6}{5}x^{-6/5}$

B) $f'(x) = \frac{1}{5}x^{-4/5}$

C) $f'(x) = \frac{6}{5}x^{6/5}$

D) $f'(x) = 4(4\sqrt{x})$

20) _____

Give an appropriate answer.

21) If $g'(3) = 4$ and $h'(3) = -1$, find $f'(3)$ for $f(x) = 5g(x) - 3h(x) + 2$.

A) 17

B) 19

C) 23

D) 25

21) _____

Differentiate.

22) $f(x) = (4x - 6)(5x + 1)$

A) $f'(x) = 40x - 26$

C) $f'(x) = 40x - 34$

B) $f'(x) = 20x - 26$

D) $f'(x) = 40x - 13$

22) _____

23) $f(x) = (4x^3 + 9)(5x^7 - 5)$

A) $f'(x) = 200x^9 + 315x^6 - 60x$

C) $f'(x) = 16x^9 + 315x^6 - 60x$

B) $f'(x) = 16x^9 + 315x^6 - 60x^2$

D) $f'(x) = 200x^9 + 315x^6 - 60x^2$

23) _____

Solve the problem.

24) The profit in dollars from the sale of x thousand compact disc players is

$P(x) = x^3 - 3x^2 + 6x + 8$. Find the marginal profit when the value of x is 12.

A) \$374

B) \$366

C) \$1404

D) \$1412

24) _____

25) The median weight, w , of a girl between the ages of 0 and 36 months can be approximated by the function 25) _____

$$w(t) = 0.0006t^3 - 0.0484t^2 + 1.61t + 7.60,$$

where t is measured in months and w is measured in pounds.

For a girl of median weight, find the rate of change of weight with respect to time at age 20 months.

- A) 0.882 lb/mo B) 0.394 lb/mo C) 0.086 lb/mo D) 1.362 lb/mo

Answer Key

Testname: 1106 PRACTICE TEST 1 FALL 2009

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