

Exam 1 Review Calculus with Applications (Each problem is worth 7 points.)

Name _____

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

Give the domain of the function.

1) $f(x) = |7x + 6|$

A) $\left(-\infty, -\frac{6}{7}\right) \cup \left(-\frac{6}{7}, \infty\right)$

C) $[0, \infty)$

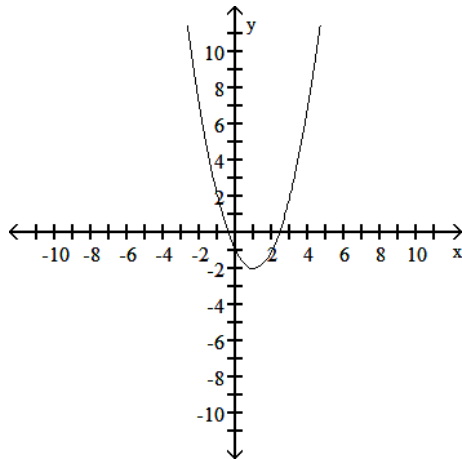
B) $(-\infty, \infty)$

D) $\left[-\frac{6}{7}, \infty\right)$

1) _____

Give the domain and range of the function.

2)



A) Domain $(-\infty, \infty)$; Range $[-2, \infty)$

B) Domain $(-\infty, 0)$; Range $(-\infty, 0)$

C) Domain $(-\infty, 0) \cup (0, \infty)$; Range $(-\infty, 0) \cup (0, \infty)$

D) Domain $(0, \infty)$; Range $[3, \infty)$

2) _____

Find the slope of the line passing through the given pair of points.

3) (2, 4) and (-8, 3)

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

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

C) 10

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

3) _____

Evaluate the function.

4) $f(x) = 5x^2 + 2x + 2$; Find $f(2)$.

A) 18

B) 22

C) 10

D) 26

4) _____

Find the asymptotes of the function.

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

A) Vertical asymptote at $x = -5$

B) Vertical asymptote at $x = 5$

C) Vertical asymptote at $x = -1/5$

D) Vertical asymptote at $x = 1/5$

5) _____

Use the properties of limits to help decide whether the limit exists. If the limit exists, find its value.

6) $\lim_{x \rightarrow -9} \frac{x^2 + 13x + 36}{x + 9}$ 6) _____

- A) Does not exist B) -5 C) 234 D) 13

7) $\lim_{x \rightarrow 3} \frac{x^2 + 3x - 18}{x^2 - 9}$ 7) _____

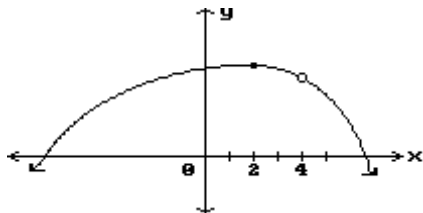
- A) 0 B) Does not exist C) $\frac{3}{2}$ D) $-\frac{1}{2}$

8) $\lim_{x \rightarrow 0} \frac{\frac{1}{x+6} - \frac{1}{6}}{x}$ 8) _____

- A) 0 B) $\frac{1}{36}$ C) $-\frac{1}{36}$ D) Does not exist

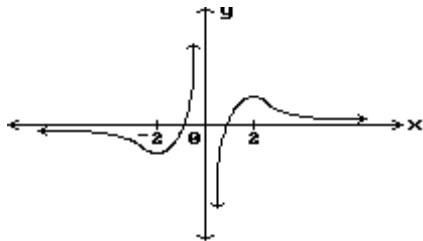
Find all points where the function is discontinuous.

9) 9) _____



- A) $x = 2$ B) None C) $x = 4, x = 2$ D) $x = 4$

10) 10) _____



- A) $x = 0$ B) $x = -2, x = 2$
 C) None D) $x = -2, x = 0, x = 2$

Find all values $x = a$ where the function is discontinuous.

11) $f(x) = \frac{|x^2 - 4|}{x - 10}$ 11) _____

- A) $a = 10$ B) Nowhere C) $a = -2, 2, 10$ D) $a = 2, 10$

TRUE/FALSE. The following function is continuous at $x = 5$.

12) $f(x) = \begin{cases} 3 & \text{if } x < 5 \\ x + 5 & \text{if } 5 \leq x \leq 9 \\ 14 & \text{if } x > 9 \end{cases}$ 12) _____

- A) True B) False

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

Give an appropriate response.

13) Find the limit of $f(x)$ as x approaches 3 from the right.

13) _____

$$f(x) = \begin{cases} -2 & \text{if } x < 3 \\ x + 2 & \text{if } 3 \leq x \leq 5 \\ 7 & \text{if } x > 5 \end{cases}$$

A) 7

B) 5

C) -2

D) The limit does not exist.

Find the value of the constant k that makes the function continuous.

$$14) f(x) = \begin{cases} x^2 + x + k & \text{if } x < 3 \\ x^3 & \text{if } x \geq 3 \end{cases}$$

14) _____

A) $k = 39$

B) $k = 12$

C) $k = 15$

D) $k = 27$