Test Form C **Name** _____ **Date** _____

Chapter 1 **Class** _____ **Section** _____

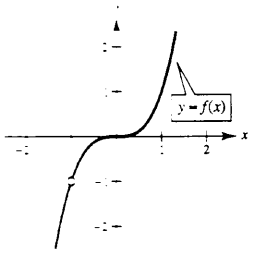
A graphing calculator is needed for some problems.

1. Use a graphing calculator to graph the function: $f(x) = -x^2 + 4x$ and then estimate $\lim_{x \to 2} f(x)$ (if it exists).

(a) 0 (b) 12 (c) 4

(d) -12 (e) None of these

2. Use the graph to find $\lim_{x \to -1} f(x)$ (if it exists).



(a) 1

(b) -2

(c) The limit does not exist.

(d) -1

(e) -3

3. Find the limit: $\lim_{x \to 1} \dfrac{x^2 + x - 2}{x - 3}$.

(a) 3 (b) 0 (c) $-\dfrac{1}{2}$

(d) The limit does not exist. (e) None of these

4. Find the limit: $\lim_{x \to \pi/2} \dfrac{\sin x}{x}$.

(a) 0 (b) $\dfrac{2}{\pi}$ (c) $-\dfrac{\pi}{2}$

(d) $\dfrac{2\sqrt{2}}{\pi}$ (e) None of these

5. Use a graphing calculator to graph the function $f(x) = \dfrac{x - 2}{x + 3}$ and then estimate $\lim_{x \to 0} f(x)$.

(a) $-\dfrac{2}{3}$ (b) 2 (c) -3

(d) 0 (e) None of these

6. Find the limit: $\lim_{x \to -9} \dfrac{x^2 + 6x - 27}{x + 9}$.

(a) -12 (b) The limit does not exist. (c) -3

(d) 0 (e) None of these

7. Find the limit: $\lim_{x\to 0} \dfrac{\dfrac{1}{x+3} - \dfrac{1}{3}}{x}$.

(a) $-\dfrac{1}{9}$ (b) 0 (c) $\dfrac{1}{9}$

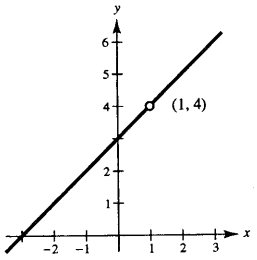
(d) The limit does not exist. (e) None of these

8. Find the limit: $\lim_{x\to 0} \dfrac{1 - \cos^2 x}{x}$.

(a) 1 (b) 0 (c) ∞

(d) The limit does not exist. (e) None of these

9. Match the graph with the correct function.



(a) $f(x) = \dfrac{x+3}{x-1}$ (b) $f(x) = x + 3$

(c) $f(x) = \dfrac{x-1}{x^2+2x-3}$ (d) $f(x) = \dfrac{x^2+2x-3}{x-1}$

(e) None of these

10. Find the x-values (if any) for which f is not continuous. $f(x) = \begin{cases} \dfrac{1}{x-3}, & x \le 5 \\ \dfrac{1}{2}, & x > 5 \end{cases}$

(a) 5 (b) $\frac{1}{2}$

(c) 3 (d) 3, 5

(e) None of these

11. Determine all values of c so that the function f is continuous on $(-\infty, \infty)$. $f(x) = \begin{cases} x^2, & x < c \\ 2x + 3, & x \ge c \end{cases}$

(a) 3 (b) -1 (c) $-3, 1$

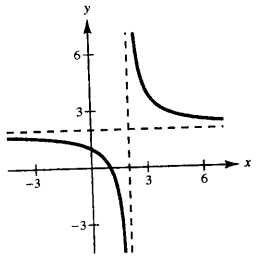
(d) $-1, 3$ (e) 1

12. Use a graphing calculator to graph $f(x) = x^3 - 2x - 5$. Then use this graph to find the interval for which the Intermediate Value Theorem guarantees the existence of at least one number c in that interval for which $f(c) = 0$.

(a) $[-1, 1]$ (b) $[1, 2]$ (c) $[2, 3]$

(d) $[3, 4]$ (e) None of these

13. Use the graph to find the interval(s) for which the function f is continuous.



(a) $(-\infty, 2)$ and $(2, \infty)$ (b) $(-\infty, \infty)$

(c) $(-\infty, 1)$ and $(1, \infty)$ (d) $(1, 2)$

(e) None of these

14. Find the limit: $\lim_{x \to (1/2)^+} \sqrt{2x - 1}$.

(a) 0 (b) 2 (c) 1

(d) The limit does not exist. (e) None of these

15. Find the limit: $\lim_{x \to 6^-} \dfrac{|3x - 18|}{6 - x}$.

(a) -1 (b) 1 (c) 3

(d) -3 (e) None of these

16. Which of the following statements is not true of $f(x) = \sqrt{x^2 - 25}$?

(a) f is continuous at $x = 10$. (b) f is continuous on the interval $(-\infty, -5]$.

(c) f is continuous on the interval $[5, \infty)$. (d) f is continuous on the interval $[-5, 5]$.

(e) f is not continuous at $x = 0$.

17. Find the limit: $\lim_{x \to 1^-} \dfrac{-2}{x - 1}$.

(a) ∞ (b) $-\infty$ (c) 0

(d) The limit does not exist. (e) None of these

18. Find the limit: $\lim_{x \to 3^-} \dfrac{x^2 - 3x + 2}{x^2 - 5x + 6}$.

(a) $\dfrac{1}{3}$ (b) $+\infty$ (c) $-\infty$

(d) 1 (e) None of these

19. Find the vertical asymptote(s): $f(x) = \dfrac{x - 2}{x^2 - 3x - 10}$.

(a) $x = -2, x = 5$ (b) $y = 1$ (c) $y = 0$

(d) $x = 5$ (e) $x = -5$

20. $f(x)$ decreases without bound as x approaches what value from the right? $f(x) = \dfrac{4}{(x - 3)(5 - x)}$

(a) 5 (b) -3 (c) -5

(d) 3 (e) None of these

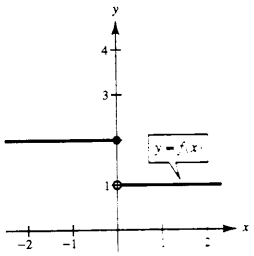
Test Form E
Chapter 1

Name _____ Date _____

Class _____ Section _____

A graphing calculator is needed for some problems.

1. Use the graph to find $\lim_{x \to 0} f(x)$ (if it exists).



2. Determine whether the statement is true or false. If it is false, give an example to show that it is false.
If $\lim_{x \to 3} f(x) = 9$, then $f(3) = 9$.

3. Calculate the limit: $\lim_{x \to 2} (2x^2 - 6x + 1)$.

4. Find the limit: $\lim_{x \to 1} \dfrac{x^2 + x - 2}{x - 3}$.

5. Find the limit: $\lim_{x \to \pi} \dfrac{x}{\cos x}$.

6. Use a graphing calculator to graph the function $f(x) = -x^5 + x + 5$ and then estimate $\lim_{x \to -1} f(x)$.

7. Let $f(x) = \dfrac{x^2 - 4}{x - 2}$.

a. Use a graphing calculator to graph the function.

b. Use the graph to estimate $\lim_{x \to 2} f(x)$.

c. Find the limit by analytical methods.

8. Let $f(x) = \dfrac{x^3 + 2x^2}{x + 2}$.

a. Find $\lim_{x \to -2} f(x)$ (if it exists).

b. Identify another function that agrees with $f(x)$ at all but one point.

c. Sketch the graph of $f(x)$.

9. Find the limit: $\lim_{\Delta x \to 0} \dfrac{\sqrt{(x + \Delta x) + 2} - \sqrt{x + 2}}{\Delta x}$.

10. Find the limit: $\lim_{\Delta x \to 0} \dfrac{(x + \Delta x)^2 - 2(x + \Delta x) - (x^2 - 2x)}{\Delta x}$.

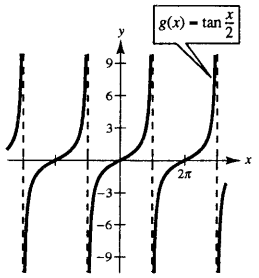
11. Find the x-values (if any) for which f is not continuous.

$$f(x) = \begin{cases} 3x + 2, & x < -1 \\ 2x^2 - 3x + 6, & x \geq -1 \end{cases}$$

12. Determine all values of c so that the function f is continuous on $(-\infty, \infty)$.

$$f(x) = \begin{cases} x^2, & x < c \\ x + 1, & x \geq c \end{cases}$$

13. Find the interval(s) for which the function g shown in the graph is continuous.



14. Use the Intermediate Value Theorem to show that the function $f(x) = x^4 - 2x^2 + 3x$ has a zero in the interval $[-2, -1]$.

15. Use a graphing calculator to graph $f(x) = \dfrac{x + 2}{x^2 - 4}$. Then use the graph to determine x-values at which the function is not continuous.

16. Let $f(x) = \begin{cases} x^2 + 1, & x \leq 0 \\ 2x - 3, & x > 0 \end{cases}$. Find each limit (if it exists).

a. $\lim_{x \to 0^-} f(x)$ **b.** $\lim_{x \to 0^+} f(x)$ **c.** $\lim_{x \to 0} f(x)$

17. Use a graphing calculator to find the limit: $\lim_{x \to 0} \dfrac{\sin 3x}{x}$. Then verify your answer analytically.

18. Find all vertical asymptotes of $f(x) = \dfrac{x^2 - x - 2}{x^2 + x - 6}$.

19. Find the limit: $\lim_{x \to 3^-} \dfrac{1}{x - 3}$.

20. Find the limit: $\lim_{x \to 1} \dfrac{-2}{(1 - x)^2}$.