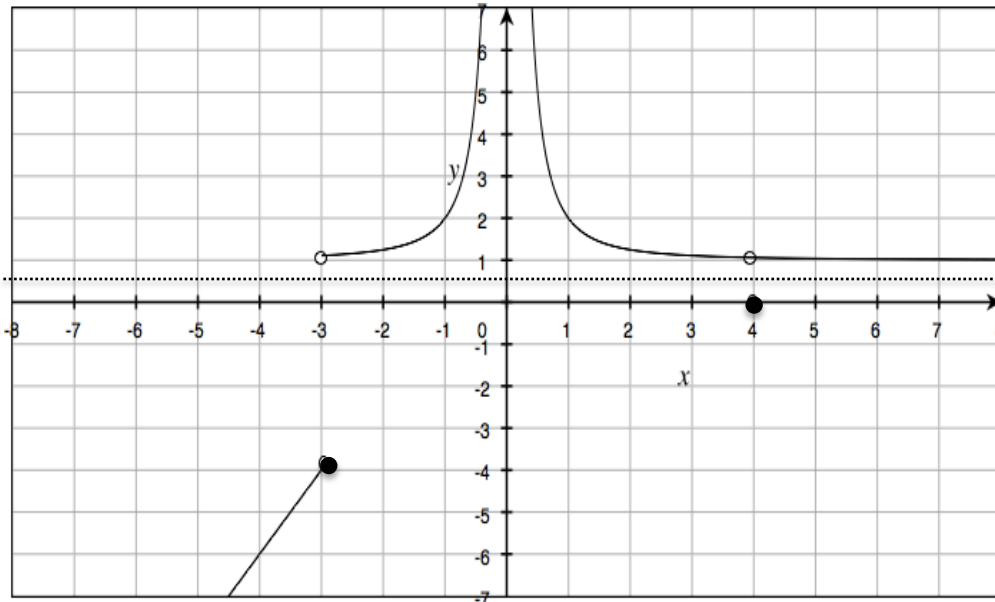


Calculus Honors Chapter 1 Review

1. Find the following:



a. $f(4)$

b. $f(-3)$

c. $\lim_{x \rightarrow -3} f(x)$

d. $\lim_{x \rightarrow 0} f(x)$

e. $\lim_{x \rightarrow 4} f(x)$

f. $\lim_{x \rightarrow \infty} f(x)$

Evaluate. Explain if the limit does not exist.

2. $\lim_{x \rightarrow 0} \frac{\sin 4x}{11x}$

3. $\lim_{x \rightarrow 0} \frac{\sin x(1 - \cos x)}{x^2}$

4. $\lim_{x \rightarrow 2} f(x)$ if $f(x) = \begin{cases} 3x^2 - 7, & x \leq 2 \\ x^3 + 1, & x > 2 \end{cases}$

5. $\lim_{x \rightarrow 2^-} \frac{1}{x-2}$

6. $\lim_{x \rightarrow -5} \frac{x-5}{x^2-25}$

7. $\lim_{x \rightarrow 2} \frac{3x^2 - 4x - 4}{2x^2 - 8}$

8. $\lim_{x \rightarrow 0} \frac{\sqrt{x+1} - 1}{x}$

9. $\lim_{x \rightarrow 0} \frac{1}{2^x}$

10. $\lim_{x \rightarrow 6^-} (3[x-3])$

11. $\lim_{x \rightarrow 5} \csc\left(\frac{\pi x}{4}\right)$

12. $\lim_{x \rightarrow \infty} \frac{7x-9}{5-3x}$

13. $\lim_{x \rightarrow -\infty} \frac{\sqrt{9x^2+1}}{2x}$

14. $\lim_{x \rightarrow \infty} \frac{\sqrt{9x^2+1}}{2x}$

15. $\lim_{x \rightarrow \infty} \frac{4}{x+5}$

16. $\lim_{x \rightarrow -\infty} \frac{7x^2-9}{4x+3}$

17. $\lim_{x \rightarrow -6} \frac{|x+6|}{x+6}$

18. State all asymptotes and the types of discontinuities (if any).

$$y = \frac{x+4}{x^3-16x}$$

19. Find the value of a so that $f(x)$ is continuous.

$$f(x) = \begin{cases} 3x+a, & x \leq -3 \\ ax^2+4, & x > -3 \end{cases}$$

20. Find a and b so that $f(x)$ is continuous.

$$f(x) = \begin{cases} 2x-3ax^2, & x < 1 \\ bx-4, & 1 \leq x \leq 2 \\ x^2+a, & x > 2 \end{cases}$$

21. Verify if IVT applies, then find c that is guaranteed by the theorem.

$$f(x) = x^2 - x - 12 \quad [-5, -1] \quad f(c) = 0$$

Chapter 1 Review Answers

1a 0

1b -4

1c dne

1d infinity

1e 1

1f $1/2$

2 $4/11$

3 0

4 dne

5 negative infinity

6 dne

7 1

8 $1/2$

9 1

10 6

11 $-\sqrt{2}$

12 $-7/3$

13 $-3/2$

14 $3/2$

15 0

16 negative infinity

17 dne

18 $x = -4$ removable

$x = 0, 4$ nonremovable

$x = 0; x = 4, y = 0$ asymptotes

19 $a = -13/8$

20 $a = 4/7; b = 30/7$

21 $c = -3$