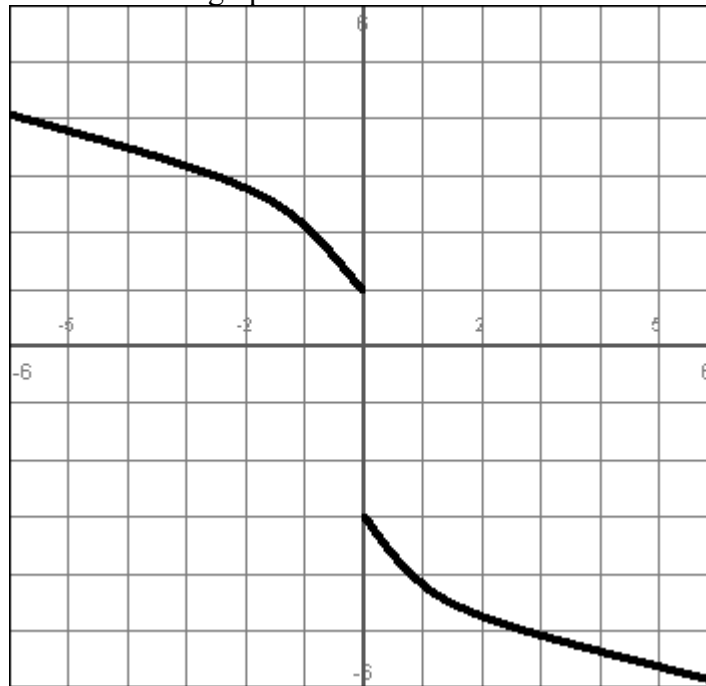


1. The function $f(x)$ is shown in the graph:



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

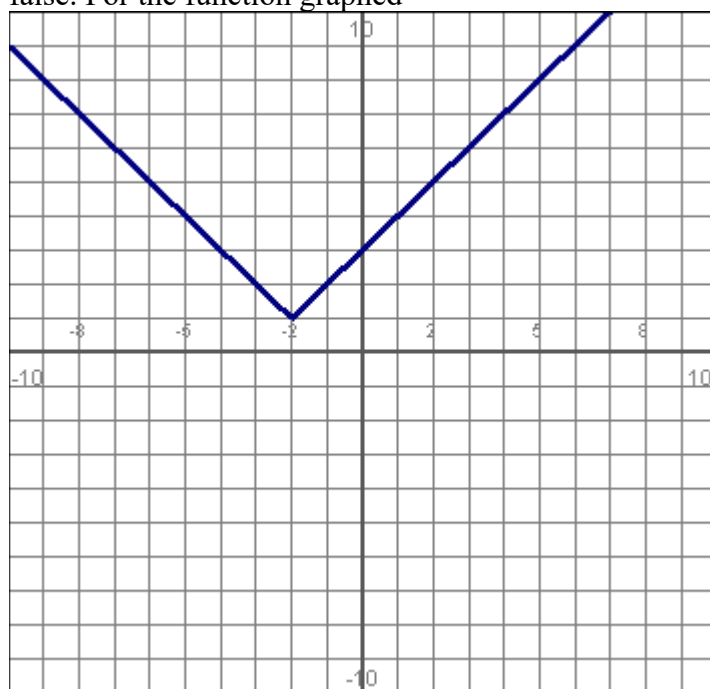
A) 2 B) -3 C) 3 D) -2 E) 0

Ans: B

Difficulty: Easy

Section: 1.1

2. Answer true or false. For the function graphed



$\lim_{x \rightarrow 2} f(x)$ is undefined

Ans: False

Difficulty: Easy

Section: 1.1

3. Approximate the

$$\lim_{x \rightarrow 5} \frac{x^2 - 25}{x - 5} \text{ by evaluating } f(x) = \frac{x^2 - 25}{x - 5}$$

at $x = 4.5, 4.9, 4.99, 4.999, 5.5, 5.1, 5.01, \text{ and } 5.001$.

A) 5 B) 2.5 C) 11 D) 10 E) 12

Ans: D

Difficulty: Medium

Section: 1.1

4. Answer true or false. If $\lim_{x \rightarrow 8^+} f(x) = 9$ and $\lim_{x \rightarrow 8^-} f(x) = 9$ then $\lim_{x \rightarrow 8} f(x) = 0$

Ans: False

Difficulty: Easy

Section: 1.1

5. Approximate the $\lim_{x \rightarrow -12^-} \frac{x}{x+12}$ by evaluating $f(x) = \frac{x}{x+12}$ at appropriate values of x .
 A) 1 B) 0 C) ∞ D) $-\infty$ E) 12

Ans: C

Difficulty: Easy

Section: 1.1

6. Approximate the limit by evaluating $f(x) = \frac{9x}{\sin x}$ at appropriate values of x . $\lim_{x \rightarrow 0^-} \frac{9x}{\sin x} =$
 A) 1 B) 9 C) -9 D) ∞ E) undefined

Ans: B

Difficulty: Medium

Section: 1.1

7. Approximate the limit by evaluating $f(x) = \frac{\sin x}{9x}$ at appropriate values of x . $\lim_{x \rightarrow 0} \frac{\sin x}{9x} =$
 A) 1 B) -9 C) $\frac{1}{9}$ D) ∞ E) undefined

Ans: C

Difficulty: Medium

Section: 1.1

8. Approximate the limit by evaluating $f(x) = \frac{\sqrt{x+49}-7}{x}$ at appropriate values of x .
 $\lim_{x \rightarrow 0^-} \frac{\sqrt{x+49}-7}{x} =$

- A) $\frac{1}{14}$ B) $\frac{1}{49}$ C) $\frac{1}{7}$ D) 0 E) ∞

Ans: A

Difficulty: Medium

Section: 1.1

9. Approximate the horizontal asymptote of $f(x) = \frac{2-11x}{8+x}$.
 A) -8 B) 8 C) -11 D) 2 E) 11

Ans: C

Difficulty: Medium

Section: 1.1

10. $\lim_{x \rightarrow 0} \frac{\sin(35x)}{\sin(5x)} =$

- A) 35 B) ∞ C) 0 D) It does not exist E) 7

Ans: E

Difficulty: Hard

Section: 1.1

11. Find the equation of the tangent line to the graph of $y = 3x^5$ at $(-1, -3)$.

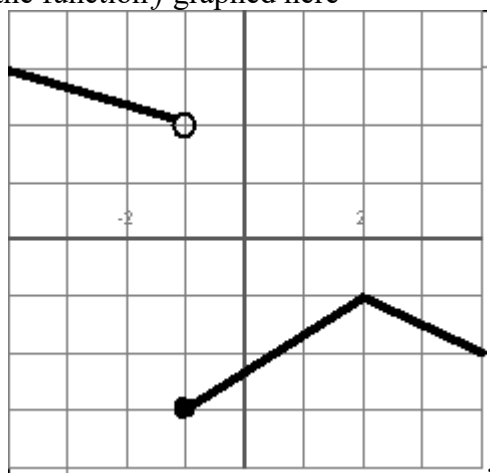
- A) $y = 15x + 12$ B) $y = 15x$ C) $y = 12x$ D) $y = 12x + 15$ E) $y = 5x + 12$

Ans: A

Difficulty: Hard

Section: 1.1

12. For the function f graphed here



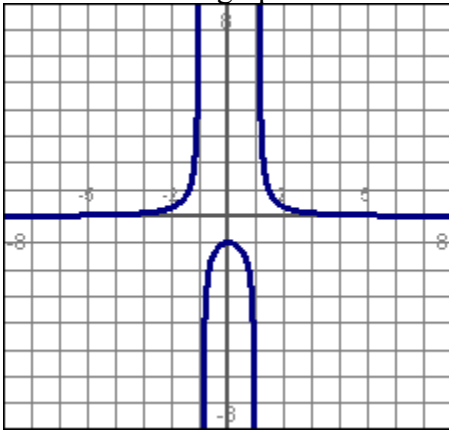
find $\lim_{x \rightarrow -1} f(x)$

Ans: Does not exist

Difficulty: Easy

Section: 1.1

13. For the function graphed here



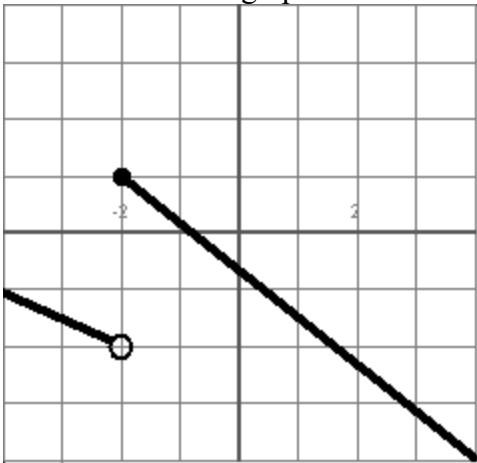
Find $\lim_{x \rightarrow -1^-} f(x)$.

Ans: $+\infty$

Difficulty: Easy

Section: 1.1

14. For the function h graphed here



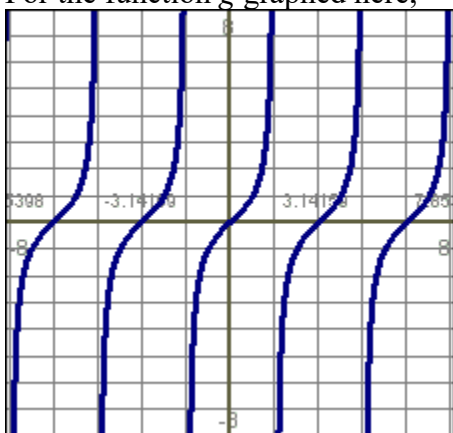
find $\lim_{x \rightarrow -2^-} f(x)$

Ans: -2

Difficulty: Easy

Section: 1.1

15. For the function g graphed here,



find $\lim_{x \rightarrow -\frac{\pi}{2}^+} g(x)$ and identify the function.

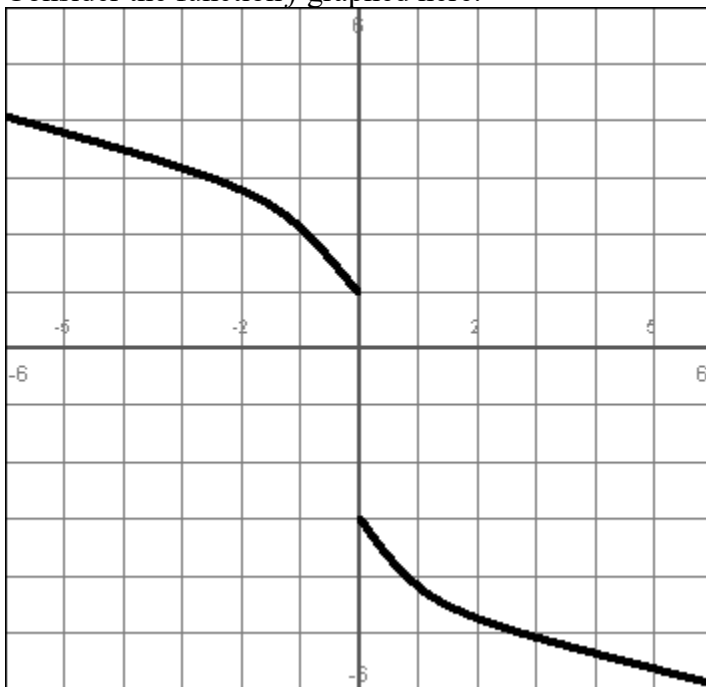
Ans: $-\infty$

$$g(x) = \tan x$$

Difficulty: Easy

Section: 1.1

16. Consider the function f graphed here:



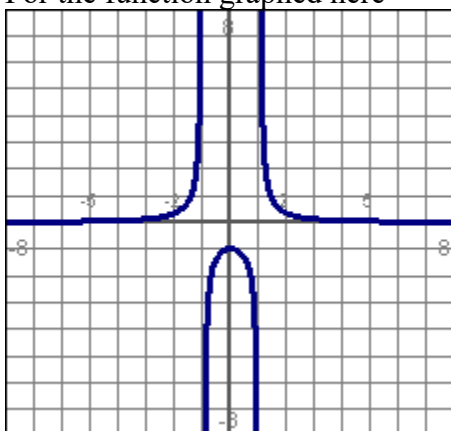
For what values of a does $\lim_{x \rightarrow a} f(x)$ exist?

Ans: $(-\infty, 0) \cup (0, +\infty)$

Difficulty: Medium

Section: 1.1

17. For the function graphed here



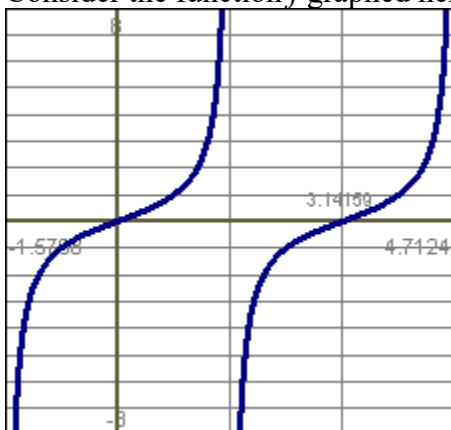
Find $\lim_{x \rightarrow +\infty} f(x)$.

Ans: 0

Difficulty: Easy

Section: 1.1

18. Consider the function f graphed here:



For what values of a does $\lim_{x \rightarrow a} f(x)$ not exist?

Ans: $\frac{\pi}{2}$ or $\pm \frac{(2n-1)\pi}{2}$, for $n = 1, 2, 3, \dots$

Difficulty: Medium

Section: 1.1

19. Consider the function f graphed here:



For what values of a does $\lim_{x \rightarrow a} f(x)$ exist?

Ans: $(-\infty, -1) \cup (-1, 1) \cup (1, +\infty)$

Difficulty: Medium

Section: 1.1

20. Approximate $\lim_{x \rightarrow 3} -5x^4$ by evaluating $-5x^4$ at appropriate values of x .

Ans:

x	$-5x^4$
2.5	-195.31
2.9	-353.640
2.99	-399.627
3.01	-410.427
3.1	-461.760
3.5	-750.31

The limit is -405

Difficulty: Medium

Section: 1.1

21. Approximate $\lim_{x \rightarrow 5} \frac{2x}{\sin x}$ by evaluating $\frac{2x}{\sin x}$ at appropriate values of x .

Ans:

x	$\frac{2x}{\sin x}$
4.5	-9.2069
4.9	-9.9750
4.99	-10.3773
5.001	-10.4335
4.999	-10.4232
5.01	-10.4807
5.1	-11.0173
5.5	-15.5909

The limit is -10.4284

Difficulty: Hard

Section: 1.1

22. Use the substitution $t = \frac{1}{x}$ to express the limit as an equivalent limit in which $t \rightarrow 0^+$.

$$\lim_{x \rightarrow +\infty} \frac{3-x}{6+x}$$

$$\text{Ans: } \lim_{t \rightarrow 0^+} \frac{3t-1}{6t+1}$$

Difficulty: Hard

Section: 1.1