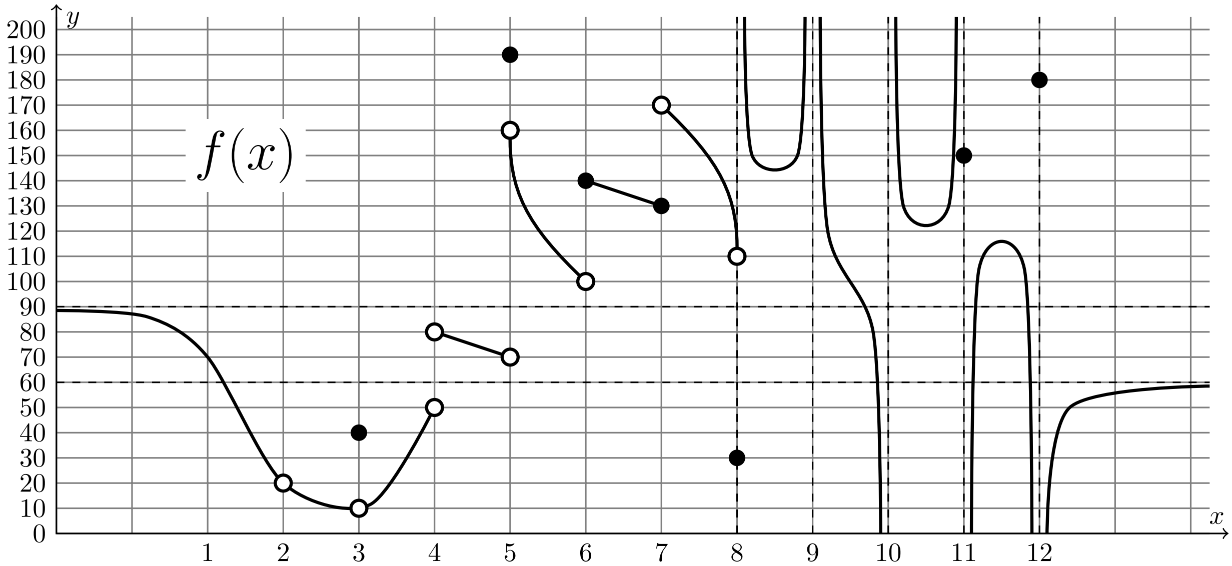


1 Finding Limits Graphically

1. $\begin{cases} f(1) = \\ \lim_{x\to 1^-} f(x) = \\ \lim_{x\to 1^+} f(x) = \\ \lim_{x\to 1} f(x) = \end{cases}$

4. $\begin{cases} f(4) = \\ \lim_{x\to 4^-} f(x) = \\ \lim_{x\to 4^+} f(x) = \\ \lim_{x\to 4} f(x) = \end{cases}$

7. $\begin{cases} f(7) = \\ \lim_{x\to 7^-} f(x) = \\ \lim_{x\to 7^+} f(x) = \\ \lim_{x\to 7} f(x) = \end{cases}$

2. $\begin{cases} f(2) = \\ \lim_{x\to 2^-} f(x) = \\ \lim_{x\to 2^+} f(x) = \\ \lim_{x\to 2} f(x) = \end{cases}$

5. $\begin{cases} f(5) = \\ \lim_{x\to 5^-} f(x) = \\ \lim_{x\to 5^+} f(x) = \\ \lim_{x\to 5} f(x) = \end{cases}$

3. $\begin{cases} f(3) = \\ \lim_{x\to 3^-} f(x) = \\ \lim_{x\to 3^+} f(x) = \\ \lim_{x\to 3} f(x) = \end{cases}$

6. $\begin{cases} f(6) = \\ \lim_{x\to 6^-} f(x) = \\ \lim_{x\to 6^+} f(x) = \\ \lim_{x\to 6} f(x) = \end{cases}$

2 Finding Limits Involving Infinity Graphically

8. $\begin{cases} f(8) = \\ \lim_{x\to 8^-} f(x) = \\ \lim_{x\to 8^+} f(x) = \\ \lim_{x\to 8} f(x) = \end{cases}$

10. $\begin{cases} f(10) = \\ \lim_{x\to 10^-} f(x) = \\ \lim_{x\to 10^+} f(x) = \\ \lim_{x\to 10} f(x) = \end{cases}$

12. $\begin{cases} f(12) = \\ \lim_{x\to 12^-} f(x) = \\ \lim_{x\to 12^+} f(x) = \\ \lim_{x\to 12} f(x) = \end{cases}$

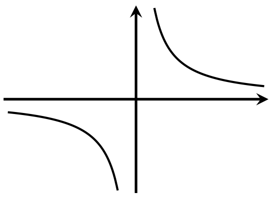
9. $\begin{cases} f(9) = \\ \lim_{x\to 9^-} f(x) = \\ \lim_{x\to 9^+} f(x) = \\ \lim_{x\to 9} f(x) = \end{cases}$

11. $\begin{cases} f(11) = \\ \lim_{x\to 11^-} f(x) = \\ \lim_{x\to 11^+} f(x) = \\ \lim_{x\to 11} f(x) = \end{cases}$

13. $\lim_{x\to -\infty} f(x) =$

14. $\lim_{x\to +\infty} f(x) =$

3 Famous Functions

15. 

$f(x) = 1/x$

$f(0) =$

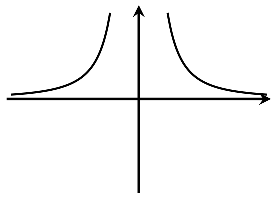
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

16. 

$f(x) = 1/x^2$

$f(0) =$

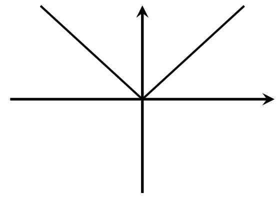
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

17. 

$f(x) = |x|$

$f(0) =$

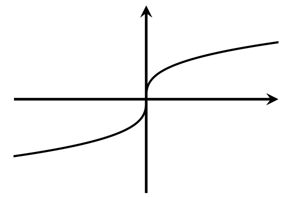
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

18. 

$f(x) = \sqrt[3]{x}$

$f(0) =$

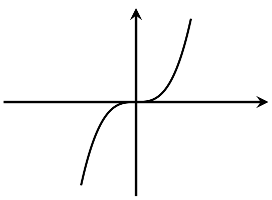
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

19. 

$f(x) = x^3$

$f(0) =$

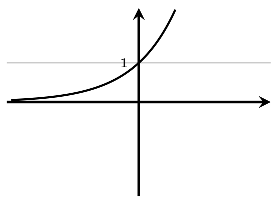
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

20. 

$f(x) = e^x$

$f(0) =$

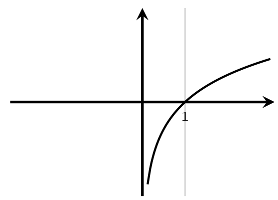
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

21. 

$f(x) = \ln(x)$

$f(0) =$

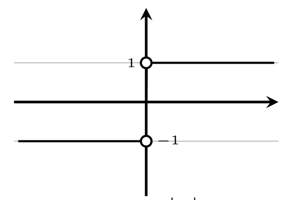
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

22. 

$f(x) = \dfrac{|x|}{x}$

$f(0) =$

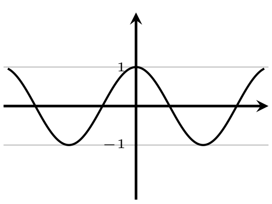
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

23. 

$f(x) = \cos(x)$

$f(0) =$

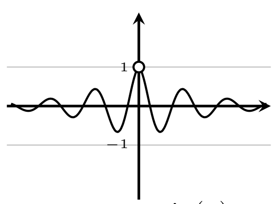
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

24. 

$f(x) = \dfrac{\sin(x)}{x}$

$f(0) =$

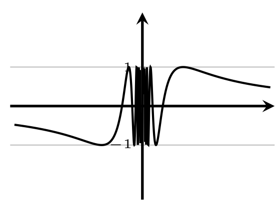
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

25. 

$f(x) = \sin(1/x)$

$f(0) =$

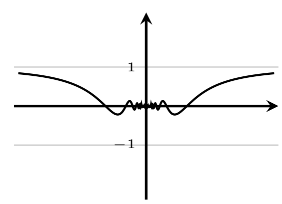
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$

26. 

$f(x) = x\sin(1/x)$

$f(0) =$

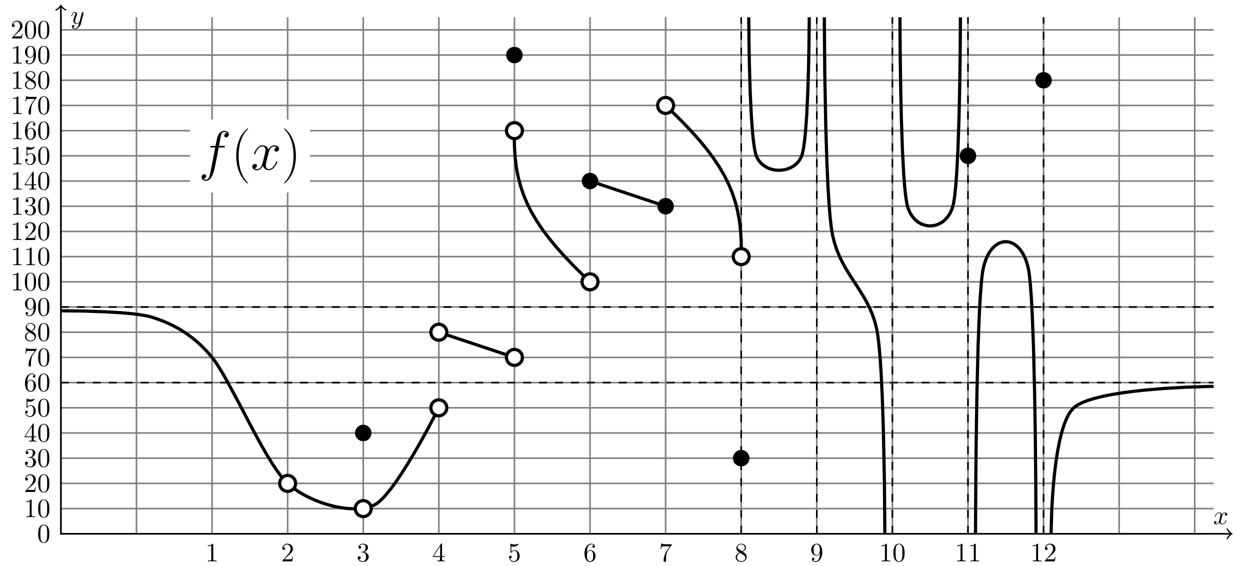
$\lim_{x\to\mathbf{0}^-} f(x) =$

$\lim_{x\to\mathbf{0}^+} f(x) =$

$\lim_{x\to\mathbf{0}} f(x) =$

$\lim_{x\to-\infty} f(x) =$

$\lim_{x\to+\infty} f(x) =$



4 Identify Continuity/Discontinuity at a Point

27. We say $f(x)$ is ______________________________ if $\lim_{x\to a} f(x)$ exists and equals $f(a)$.

28. We say $f(x)$ has a ______________________________ at $x = a$ if $\lim_{x\to a} f(x)$ exists and does *not* equal $f(a)$.

29. We say $f(x)$ has a ______________________________ if $\lim_{x\to a^+} f(x)$ and $\lim_{x\to a^-} f(x)$ exist and are *un*equal.

30. We say $f(x)$ has an ______________________________ if either $\lim_{x\to a^+} f(x)$ or $\lim_{x\to a^-} f(x)$ equals either ∞ or $-\infty$.

31. The function $f(x)$ is **continuous at $x =$** ______________________________.

32. The function $f(x)$ is has a **removable discontinuity at $x =$** ______________________________.

33. The function $f(x)$ is has a **jump discontinuity at $x =$** ______________________________.

34. The function $f(x)$ is has an **infinite discontinuity at $x =$** ______________________________.

5 Identify Left and Right Continuity at a Point

35. We say $f(x)$ is ______________________________ if $\lim_{x\to a^-} f(x)$ exists and equals $f(a)$.

36. We say $f(x)$ is ______________________________ if $\lim_{x\to a^+} f(x)$ exists and equals $f(a)$.

37. The function $f(x)$ is **left continuous at $x =$** ______________________________.

38. The function $f(x)$ is **right continuous at $x =$** ______________________________.

6 Continuity on an Interval

We say $f(x)$ is **continuous on (a, b)** if $f(x)$ is continuous at $x = c$ for all c in (a, b).

39. We say $f(x)$ is **continuous on $[a, b]$** if $f(x)$ is continuous at $x = c$ for all c in (a, b),

and ______________________________ and ______________________________.

40. We say $f(x)$ is **continuous everywhere** if $f(x)$ is continuous at $x = c$ for all c in ____________.

41. We say $f(x)$ is **continuous** if it is continuous on every open interval in ______________________________.

42. Find the union of all open intervals (a, b) such that $f(x)$ is **continuous on (a, b)**. Use interval notation.

43. The function $f(x)$ fails to be **continuous** (on every open interval in its domain). It fails at $x =$ ________________.