

Calculus Practice: Discontinuities 1b

Determine if each function is continuous. If the function is not continuous, find the x -axis location of and classify each discontinuity.

1) $f(x) = -x^3 + x^2 - 3$

2) $f(x) = -\frac{x+2}{x^2-4}$

3) $f(x) = \begin{cases} -x^2 - 6x - 8, & x \leq -3 \\ x - 2, & x > -3 \end{cases}$

4) $f(x) = \frac{x-2}{x^2-4}$

5) $f(x) = \begin{cases} -x - 2, & x \leq 0 \\ -\frac{x}{2} - 1, & x > 0 \end{cases}$

6) $f(x) = \cos \frac{1}{x - \pi}$

7) $f(x) = -x^3 - 10x^2 - 32x - 33$

8) $f(x) = \sin \frac{1}{x}$

9) $f(x) = \frac{x-4}{x^2+3x}$

10) $f(x) = \frac{x}{x^2-4x+4}$

$$11) f(x) = \sin \frac{1}{x - \pi}$$

$$12) f(x) = \frac{x}{x^2 + 6x + 9}$$

$$13) f(x) = \begin{cases} 1, & x \leq 1 \\ x + 3, & x > 1 \end{cases}$$

$$14) f(x) = \frac{x - 3}{x^2 - 2x - 3}$$

$$15) f(x) = \begin{cases} -1, & x < 2 \\ x^2 - 6x + 8, & x \geq 2 \end{cases}$$

$$16) f(x) = \frac{x^2 + x - 6}{x - 2}$$

$$17) f(x) = -\sec(x); [-\pi, \pi]$$

$$18) f(x) = \frac{x^2}{2} - 3x + \frac{3}{2}$$

$$19) f(x) = -\frac{x^2}{2x - 4}$$

$$20) f(x) = \frac{x^2 - 3x}{x - 3}$$

Calculus Practice: Discontinuities 1b

Determine if each function is continuous. If the function is not continuous, find the x -axis location of and classify each discontinuity.

1) $f(x) = -x^3 + x^2 - 3$

Continuous

2) $f(x) = -\frac{x+2}{x^2-4}$

Removable discontinuity at: $x = -2$ Infinite discontinuity at: $x = 2$

3) $f(x) = \begin{cases} -x^2 - 6x - 8, & x \leq -3 \\ x - 2, & x > -3 \end{cases}$

Jump discontinuity at: $x = -3$

4) $f(x) = \frac{x-2}{x^2-4}$

Removable discontinuity at: $x = 2$ Infinite discontinuity at: $x = -2$

5) $f(x) = \begin{cases} -x - 2, & x \leq 0 \\ -\frac{x}{2} - 1, & x > 0 \end{cases}$

Jump discontinuity at: $x = 0$

6) $f(x) = \cos \frac{1}{x - \pi}$

Oscillating discontinuity at: $x = \pi$

7) $f(x) = -x^3 - 10x^2 - 32x - 33$

Continuous

8) $f(x) = \sin \frac{1}{x}$

Oscillating discontinuity at: $x = 0$

9) $f(x) = \frac{x-4}{x^2+3x}$

Infinite discontinuities at: $x = -3, x = 0$

10) $f(x) = \frac{x}{x^2-4x+4}$

Infinite discontinuity at: $x = 2$

$$11) f(x) = \sin \frac{1}{x - \pi}$$

Oscillating discontinuity at: $x = \pi$

$$12) f(x) = \frac{x}{x^2 + 6x + 9}$$

Infinite discontinuity at: $x = -3$

$$13) f(x) = \begin{cases} 1, & x \leq 1 \\ x + 3, & x > 1 \end{cases}$$

Jump discontinuity at: $x = 1$

$$14) f(x) = \frac{x - 3}{x^2 - 2x - 3}$$

Removable discontinuity at: $x = 3$

Infinite discontinuity at: $x = -1$

$$15) f(x) = \begin{cases} -1, & x < 2 \\ x^2 - 6x + 8, & x \geq 2 \end{cases}$$

Jump discontinuity at: $x = 2$

$$16) f(x) = \frac{x^2 + x - 6}{x - 2}$$

Removable discontinuity at: $x = 2$

$$17) f(x) = -\sec(x); [-\pi, \pi]$$

Infinite discontinuities at: $x = -\frac{\pi}{2}, x = \frac{\pi}{2}$

$$18) f(x) = \frac{x^2}{2} - 3x + \frac{3}{2}$$

Continuous

$$19) f(x) = -\frac{x^2}{2x - 4}$$

Infinite discontinuity at: $x = 2$

$$20) f(x) = \frac{x^2 - 3x}{x - 3}$$

Removable discontinuity at: $x = 3$