Calculus Practice: Use Derivatives to Analyze Functions 3b

For each problem, find all discontinuities.

1) $f(x) = -\dfrac{x}{x^2 - 9}$

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

3) $y = -\dfrac{16x}{x^2 + 16}$

4) $y = \left(\dfrac{x}{x - 3}\right)^2$

5) $y = -\dfrac{x^2}{3x + 3}$

6) $y = -\dfrac{5x^2 - 5}{x^3}$

7) $f(x) = \dfrac{3}{x + 1}$

8) $y = \dfrac{3}{x - 2}$

9) $f(x) = \dfrac{7x^2 - 7}{x^3}$

10) $y = \dfrac{20}{x^2 + 4}$

11) $y = \cot(x)$; $[-\pi, \pi]$

12) $f(x) = \cos(x)$; $[-\pi, \pi]$

13) $y = \csc(x)$; $[-\pi, \pi]$

14) $f(x) = 2\csc(2x)$; $[-\pi, \pi]$

15) $f(x) = 2\tan(2x)$; $[-\pi, \pi]$

16) $f(x) = -2\cos(x)$; $[-\pi, \pi]$

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

18) $y = -\cot(x)$; $[-\pi, \pi]$

19) $f(x) = -2\cot(2x)$; $[-\pi, \pi]$

20) $y = \csc(2x)$; $[-\pi, \pi]$

Calculus Practice: Use Derivatives to Analyze Functions 3b

For each problem, find all discontinuities.

1) $f(x) = -\dfrac{x}{x^2 - 9}$

Discontinuities at: $x = -3, 3$

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

Discontinuity at: $x = -2$

3) $y = -\dfrac{16x}{x^2 + 16}$

No discontinuities exist.

4) $y = \left(\dfrac{x}{x - 3}\right)^2$

Discontinuity at: $x = 3$

5) $y = -\dfrac{x^2}{3x + 3}$

Discontinuity at: $x = -1$

6) $y = -\dfrac{5x^2 - 5}{x^3}$

Discontinuity at: $x = 0$

7) $f(x) = \dfrac{3}{x + 1}$

Discontinuity at: $x = -1$

8) $y = \dfrac{3}{x - 2}$

Discontinuity at: $x = 2$

9) $f(x) = \dfrac{7x^2 - 7}{x^3}$

Discontinuity at: $x = 0$

10) $y = \dfrac{20}{x^2 + 4}$

No discontinuities exist.

11) $y = \cot(x);\ [-\pi, \pi]$

Discontinuities at: $x = -\pi, 0, \pi$

12) $f(x) = \cos(x);\ [-\pi, \pi]$

No discontinuities exist.

13) $y = \csc(x);\ [-\pi, \pi]$

Discontinuities at: $x = -\pi, 0, \pi$

14) $f(x) = 2\csc(2x);\ [-\pi, \pi]$

Discontinuities at: $x = -\pi, -\dfrac{\pi}{2}, 0, \dfrac{\pi}{2}, \pi$

15) $f(x) = 2\tan(2x);\ [-\pi, \pi]$

Discontinuities at: $x = -\dfrac{3\pi}{4}, -\dfrac{\pi}{4}, \dfrac{\pi}{4}, \dfrac{3\pi}{4}$

16) $f(x) = -2\cos(x);\ [-\pi, \pi]$

No discontinuities exist.

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

Discontinuities at: $x = -\dfrac{\pi}{2}, \dfrac{\pi}{2}$

18) $y = -\cot(x);\ [-\pi, \pi]$

Discontinuities at: $x = -\pi, 0, \pi$

19) $f(x) = -2\cot(2x);\ [-\pi, \pi]$

Discontinuities at: $x = -\pi, -\dfrac{\pi}{2}, 0, \dfrac{\pi}{2}, \pi$

20) $y = \csc(2x);\ [-\pi, \pi]$

Discontinuities at: $x = -\pi, -\dfrac{\pi}{2}, 0, \dfrac{\pi}{2}, \pi$