Calculus Practice: Use Derivatives to Analyze Functions 7b

For each problem, find the x-coordinates of all points of inflection.

1) $f(x) = \dfrac{x}{x^2 - 16}$

2) $y = -\dfrac{1}{6}(x+1)^{\frac{7}{3}} + \dfrac{14}{3}(x+1)^{\frac{1}{3}} - 1$

3) $f(x) = -\dfrac{1}{5}(x-4)^{\frac{5}{3}} - 2(x-4)^{\frac{2}{3}}$

4) $y = \dfrac{2}{x-1}$

5) $f(x) = \dfrac{x^3}{x^2 - 1}$

6) $f(x) = -(-x+6)^{\frac{1}{2}}$

7) $y = -\dfrac{x}{x^2 - 1}$

8) $f(x) = -\frac{3}{16}(x-2)^{\frac{4}{3}} - \frac{3}{2}(x-2)^{\frac{1}{3}} - 2$

9) $f(x) = \sin(2x);\ [-\pi, \pi]$

10) $y = 2\cot(2x);\ [-\pi, \pi]$

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

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

13) $f(x) = -2\sec(2x);\ [-\pi, \pi]$

14) $y = -\cos(2x);\ [-\pi, \pi]$

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

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

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For each problem, find the x-coordinates of all points of inflection.

1) $f(x) = \dfrac{x}{x^2 - 16}$

Inflection point at: $x = 0$

2) $y = -\dfrac{1}{6}(x+1)^{\frac{7}{3}} + \dfrac{14}{3}(x+1)^{\frac{1}{3}} - 1$

Inflection point at: $x = -1$

3) $f(x) = -\dfrac{1}{5}(x-4)^{\frac{5}{3}} - 2(x-4)^{\frac{2}{3}}$

Inflection point at: $x = 6$

4) $y = \dfrac{2}{x-1}$

No inflection points exist.

5) $f(x) = \dfrac{x^3}{x^2 - 1}$

Inflection point at: $x = 0$

6) $f(x) = -(-x+6)^{\frac{1}{2}}$

No inflection points exist.

7) $y = -\dfrac{x}{x^2 - 1}$

Inflection point at: $x = 0$

8) $f(x) = -\frac{3}{16}(x-2)^{\frac{4}{3}} - \frac{3}{2}(x-2)^{\frac{1}{3}} - 2$

Inflection points at: $x = 2, 6$

9) $f(x) = \sin(2x);\ [-\pi, \pi]$

Inflection points at: $x = -\pi, -\frac{\pi}{2}, 0, \frac{\pi}{2}, \pi$

10) $y = 2\cot(2x);\ [-\pi, \pi]$

Inflection points at: $x = -\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{3\pi}{4}$

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

Inflection points at: $x = -\frac{\pi}{2}, \frac{\pi}{2}$

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

Inflection points at: $x = -\frac{\pi}{2}, \frac{\pi}{2}$

13) $f(x) = -2\sec(2x);\ [-\pi, \pi]$

No inflection points exist.

14) $y = -\cos(2x);\ [-\pi, \pi]$

Inflection points at: $x = -\frac{3\pi}{4}, -\frac{\pi}{4}, \frac{\pi}{4}, \frac{3\pi}{4}$

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

Inflection points at: $x = -\pi, -\frac{\pi}{2}, 0, \frac{\pi}{2}, \pi$

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

Inflection points at: $x = -\frac{\pi}{2}, \frac{\pi}{2}$