Calculus Worksheet

Trig Limits

Evaluate each of the following limits please.

(1) $\lim_{x \to \pi} \left(\frac{\sin(3x)}{2x - 2\pi} \right)$

(2) $\lim_{x \to \pi} \left(\frac{1 - \cos(2x)}{(x - \pi)^2} \right)$

(3) $\lim_{x \to \frac{\pi}{2}} \left(\frac{(4x - 2\pi)^2}{1 - \sin(x)} \right)$

(4) $\lim_{x \to -\frac{\pi}{2}} \left(\frac{1 + \cos(2x)}{(4x + 2\pi)^2} \right)$

(5) $\lim_{x \to 0} \left(\frac{\sin^3(3x)}{2x^3 - 5x^4} \right)$

(6) $\lim_{x \to \infty} (3x) \sin\left(\frac{2}{x} \right)$

(7) $\lim_{x \to \pi} [(x - \pi)\cot(x + \pi)]$

(8) $\lim_{x \to -\frac{\pi}{2}} \left(\frac{\cos(5x)}{\sin(4x)} \right)$

(9) $\lim_{x \to 2} \left(\frac{\sin(x - 2)}{x^3 - 8} \right)$

(10) $\lim_{x \to \frac{\pi}{3}} \left(\frac{\sin(6x)}{(3x - \pi)} \right)$

(11) $\lim_{x \to -\frac{\pi}{6}} \left(\frac{1 - 2\cos(2x)}{(6x + \pi)} \right)$

(12) $\lim_{x \to 0} \left(\frac{5x^2 - \sin^2(2x)}{3x^2} \right)$

(13) $\lim_{x \to \infty} \left(\frac{\sin(3x)}{4x} \right)$

(14) $\lim_{x \to \pi} \left(\frac{1 - \cos(5x)}{(2x + \pi)^2} \right)$

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Answers

(1) $-\frac{3}{2}$

(2) 2

(3) 32

(4) $\frac{1}{8}$

(5) $\frac{27}{2}$

(6) 6

(7) 1

(8) $\frac{5}{4}$

(9) $\frac{1}{12}$

(10) 2

(11) $-\frac{\sqrt{3}}{3}$

(12) $\frac{1}{3}$

(13) 0

(14) $\frac{2}{9\pi^2}$