Name
Date
Course

Limits (Part III)

Find the values of the limits algebraically.

① $\lim_{b \to \frac{1}{3}} \frac{27b^3 - 1}{3b - 1}$

② $\lim_{t \to -7} \frac{t + 7}{t^3 + 343}$

③ $\lim_{\theta \to 0} \frac{\sin\theta}{\tan\theta}$

④ $\lim_{A \to \frac{\pi}{2}} \frac{\cot A}{\cos A}$

⑤ $\lim_{B \to 0} \frac{1 - \cos B}{\sin^2 B}$

* Use one of the Pythagorean identities.

⑥ $\lim_{\beta \to \pi} \frac{\tan^2 \beta}{\sec \beta + 1}$

⑦ $\lim_{\theta \to \frac{\pi}{2}} \frac{\sin(2\theta)}{\cos\theta}$

⑧ $\lim_{x \to \frac{\pi}{2}} \frac{1 - \sin x}{\sin^2 x + \cos(2x)}$

⑨ $\lim_{t \to 0} \frac{\sin t \tan t}{\tan(-t)}$

⑩ $\lim_{w \to \frac{3\pi}{2}} \frac{\sec(-w)\sin w}{\sec w}$

Find the value of each limit. Write the number of the limit law used on each step.

⑪ $\lim_{x \to 0} \frac{x \log_2(x+2)}{\sin x}$

(12) $\lim_{x\to 0} \frac{\sqrt{x}\cos^2 x - \sqrt{x}}{x}$

(13) $\lim_{x\to 0} \frac{\sin^4 x}{x^4}$

(14) $\lim_{\theta\to 0} \frac{\sin\theta + \theta}{\theta}$

(15) $\lim_{x\to 0} \frac{\sin(3x)}{\sin(7x)}$

* Start by dividing both sides of the fraction by "x."

(16) $\lim_{y\to 0} \frac{\tan y}{y}$

(17) $\lim_{\theta \to 0} [\theta \cot(7\theta)]$

Homework Answers

(1) 3

(2) $\frac{1}{147}$

(3) 1

(4) 1

(5) $\frac{1}{2}$

(6) -2

(7) 2

(8) $\frac{1}{2}$

(9) 0

(10) -1

(11) 3,4,6,8 1

(12) 3,8 0

(13) 7 1

(14) 1,6 2

(15) 4 $\frac{3}{7}$

(16) 3 1

(17) 3,4,6,8 $\frac{1}{7}$