

**AP Calculus AB**  
**Properties of Limits**  
**Homework**

Evaluate each limit.

$$1) \lim_{x \rightarrow -2} (x^2 + 3x - 7)$$

$$8) \lim_{x \rightarrow 1} \left( \frac{x^2 - 3x + 2}{x^2 + x - 2} \right)^2$$

$$2) \lim_{x \rightarrow 3} (x + 5)(2x - 7)$$

$$9) \lim_{x \rightarrow 1} \frac{\sqrt{x} - 1}{x - 1}$$

$$3) \lim_{z \rightarrow 1} \frac{z^2 + z - 3}{z + 1}$$

$$10) \lim_{x \rightarrow 0} \frac{1 - \sin x}{\cos^2 x}$$

$$4) \lim_{x \rightarrow \pi/3} \sec x$$

$$11) \lim_{x \rightarrow 0} \frac{\sin 2x}{x}$$

$$5) \lim_{x \rightarrow 1/3} \frac{x \sin \pi x}{1 + \cos \pi x}$$

$$12) \lim_{x \rightarrow 0} \frac{\tan x}{x}$$

$$6) \lim_{u \rightarrow -2} \frac{4 - u^2}{2 + u}$$

$$13) \lim_{x \rightarrow 0} \frac{\frac{1}{x+3} - \frac{1}{3}}{x}$$

$$7) \lim_{x \rightarrow 1} \frac{\frac{1}{x} - 1}{x - 1}$$

Compute the one-sided limit.

$$14) \lim_{x \rightarrow 1^+} \frac{\sqrt{x-1} + x}{1 - 2x}$$

$$15) \lim_{x \rightarrow 0^+} \frac{|x|}{x}$$

$$16) \lim_{x \rightarrow 2^+} f(x) \text{ where } f(x) = \begin{cases} 3 - 2x & \text{if } x \leq 2 \\ x^2 - 5 & \text{if } x > 2 \end{cases}$$

$$17) \lim_{s \rightarrow 1^-} g(s) \text{ where } g(s) = \begin{cases} \frac{s^2 - s}{s - 1} & \text{if } s < 1 \\ \sqrt{1-s} & \text{if } s \geq 1 \end{cases}$$