

AP Calculus AB

Name: _____

Finding Limits &

Properties of Limits

HW 1-3

1) Let $f(x) = x^2 + 5x + 1$ and $g(x) = x - 1$. Find...

a) $\lim_{x \rightarrow 1} f(x)g(x)$

b) $\lim_{x \rightarrow 2} \frac{f(x)}{g(x)}$

c) $\lim_{x \rightarrow 3} 2f(x)$

d) $\lim_{x \rightarrow 4} [g(x)]^3$

e) $\lim_{x \rightarrow 1} f(g(x))$

f) $\lim_{x \rightarrow 2} g(f(x))$

Find the limit!

1) $\lim_{x \rightarrow 1} (-2x + 5)^4$

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

3) $\lim_{x \rightarrow 4} \frac{2x-1}{3x+1}$

4) $\lim_{x \rightarrow 1} \frac{2x^2 + 5x - 3}{6x^2 - 7x + 2}$

5) $\lim_{x \rightarrow -2} \frac{x^3 + 8}{x^2 - 16}$

6) $\lim_{x \rightarrow 16} \frac{x-16}{\sqrt{x}-4}$

$$7) \lim_{x \rightarrow 2} \frac{\frac{1}{x} - \frac{1}{2}}{x-2}$$

$$8) \lim_{x \rightarrow -3} \frac{x+3}{\frac{1}{x} + \frac{1}{3}}$$

$$9) \lim_{x \rightarrow 1} \left(\frac{x^2}{x-1} - \frac{1}{x-1} \right)$$

$$10) \lim_{x \rightarrow 3} \sqrt[3]{\frac{2+5x-3x^3}{x^2-1}}$$

$$11) \lim_{h \rightarrow 0} \frac{4 - \sqrt{16+h}}{h}$$

$$12) \lim_{x \rightarrow 0} \frac{2 - \cos x}{3 + \sin x}$$

$$13) \lim_{x \rightarrow 0} \frac{4 \sin x}{3x}$$

$$14) \lim_{x \rightarrow 0} \frac{2 - 2 \cos x}{4x}$$

$$15) \lim_{x \rightarrow 0} (1+2x)^{\csc x}$$

16) If $0 \leq f(x) \leq c$ and c is any real number, explain why $\lim_{x \rightarrow 0} x^2 f(x) = 0$.