



## Problem Set 2: Evaluating Limits

Evaluate the following limits:

1.  $\lim_{x \rightarrow -1} x^3 - 3x^2 + 6x - 4$

2.  $\lim_{x \rightarrow 3} \frac{x + 4}{x - 7}$

3.  $\lim_{x \rightarrow 2} \frac{x^2 - 4x + 4}{x - 2}$

4.  $\lim_{x \rightarrow 0} \frac{\sqrt{3x + 1} - 1}{x}$

5.  $\lim_{t \rightarrow 1} \frac{t^2 + t - 2}{t^2 - 1}$

6.  $\lim_{x \rightarrow 0} \frac{4x}{\sin(2x)}$

# AP Calculus AB – Unit 1

Dan the Tutor



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7.  $\lim_{h \rightarrow 9} \frac{\sqrt{h} - 3}{h - 9}$

8.  $\lim_{x \rightarrow 0} \frac{2 \cos(x) - 2}{x}$

9.  $\lim_{x \rightarrow 0} \frac{\tan(x)}{x}$

10.  $\lim_{u \rightarrow 0} \sqrt{1 - \cos^2 u}$

# AP Calculus AB – Unit 1



$$11. \lim_{x \rightarrow 1} f(x), f(x) = \begin{cases} x + 2, & x < 1 \\ -3x - 4, & x \geq 1 \end{cases}$$

$$12. \lim_{t \rightarrow 6} f(x), f(x) = \begin{cases} \sqrt{t - 5}, & x > 6 \\ 0, & x = 6 \\ \cos(\pi t), & x < 6 \end{cases}$$

$$13. \lim_{x \rightarrow 2} \frac{2}{(x - 2)^2}$$

# AP Calculus AB – Unit 1



14. If we only know that  $\lim_{x \rightarrow 2} f(x) = 4$ , indicate whether the following statements are true or false.

a)  $\lim_{x \rightarrow 4} f(x) = 4$

b)  $\lim_{x \rightarrow 4} f(x) = 8$

c)  $\lim_{x \rightarrow 2} f(3x) = 12$

d)  $\lim_{x \rightarrow 2} 5f(x) = 20$

e)  $\lim_{x \rightarrow 2} f(x - 1) = 3$

f)  $\lim_{x \rightarrow 2} f(x) - 1 = 3$

g)  $\lim_{x \rightarrow 2} f(x^2) = 16$

h)  $\lim_{x \rightarrow 2} (f(x))^2 = 16$