

Category	Preparation	Completeness	Organization/Neatness	Timeliness	Total
Points earned					

AP Calculus Problem Set 5

9/4/12

Upon completion, circle one of the following to assess your current understanding:

Completely understand	Mostly understand	Sort of understand	Don't understand
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Evaluate each limit.

$$1) \lim_{x \rightarrow -3} \frac{x^2 - x - 12}{x + 3} =$$

$$2) \lim_{x \rightarrow 0} \frac{x^4 - 7x^2}{x^3 + 3x^2} =$$

$$3) \lim_{x \rightarrow 9} \frac{x - 9}{3 - \sqrt{x}} =$$

$$4) \lim_{x \rightarrow -1} \frac{x^2 - 1}{x^2 - x - 2} =$$

$$5) \lim_{x \rightarrow 2} \frac{\frac{1}{x} - \frac{1}{2}}{x - 2} =$$

$$6) \lim_{x \rightarrow 0} \frac{x}{\sqrt{1 + 3x} - 1} =$$

$$7) \lim_{x \rightarrow 4} \frac{2x - 8}{x + 2} =$$

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

$$9) \lim_{x \rightarrow 9} \frac{x^2 - 81}{\sqrt{x} - 3} =$$

$$10) \lim_{x \rightarrow 1} \left(\frac{1}{x-1} - \frac{2}{x^2-1} \right) =$$

$$11) \lim_{x \rightarrow 2} \frac{x^4 - 16}{x - 2} =$$

$$12) \lim_{t \rightarrow 0} \frac{\sqrt{2-t} - \sqrt{2}}{t} =$$

$$13) \lim_{h \rightarrow 0} \frac{2h^2 - 8h}{6h} =$$

$$14) \lim_{x \rightarrow 2} \left(\frac{x - \sqrt{3x-2}}{x^2 - 4} \right) =$$

$$15) \lim_{x \rightarrow 0} \frac{-2 + \sqrt{x+4}}{x} =$$

$$16) \lim_{x \rightarrow 1} \frac{6x-6}{1-\sqrt{x}} =$$

$$17) \lim_{x \rightarrow 2} \frac{\sqrt{6-x} - 2}{x^2 - 4} =$$

$$18) \lim_{t \rightarrow 4} \frac{3t^2 - 48}{2t^2 - 11t + 12} =$$

$$19) \lim_{t \rightarrow -2} \frac{2t^2 - 8t - 24}{20 - 5t^2} =$$

20) The velocity of a pebble that is dropped from a cliff that is 100 feet above the ocean is given by the function $v(a) = \lim_{t \rightarrow a} \frac{h(a) - h(t)}{a - t}$ where a is the time in seconds after the pebble is dropped. The height of the pebble (in feet) above sea level is given by the function $h(t) = -16t^2 + 100$

- What will be the velocity of the pebble 1 second after it is dropped? (Hint: Let $a = 1$)
- When will the pebble land in the ocean? (Hint: What will $h(t)$ equal when it lands in the ocean?)
- Use your answer from part b) to find the velocity of the pebble when hits the ocean?