

## 1.2 Limits Analytically

Name: \_\_\_\_\_

Write your questions  
and thoughts here!**Notes**

Recall: What is a limit?

**Finding a limit:**

1.

2.

a.

b.

3.

Direct Substitution		Factor and Cancel	
1. $\lim_{x \rightarrow -1} (x^2 + 2x - 4)$	2. $\lim_{x \rightarrow 2} \sqrt{3x - 2}$	3. $\lim_{x \rightarrow 0} \frac{4x^2 - 5x}{x}$	4. $\lim_{x \rightarrow -7} \frac{2x^2 + 13x - 7}{x + 7}$
Rationalize		Two variables	
5. $\lim_{x \rightarrow 5} \frac{\sqrt{x + 4} - 3}{x - 5}$	6. $\lim_{h \rightarrow 0} \frac{(x + h)^2 - 3(x + h) - (x^2 - 3x)}{h}$		

# 1.2 Limits Analytically

## Notes

Write your questions and thoughts here!

### Piecewise defined functions and limits

$$f(x) = \begin{cases} \sqrt{11-x}, & x < -5 \\ \frac{x+3}{5-x^2}, & x \geq -5 \end{cases}$$

$$g(x) = \begin{cases} \sqrt{10-x^2}, & x < -1 \\ \frac{26-5x^2}{7}, & -1 < x \leq e \\ \ln x^3, & x > e \end{cases}$$

7.  $\lim_{x \rightarrow -5^-} f(x) =$

8.  $\lim_{x \rightarrow -5^+} f(x) =$

10.  $\lim_{x \rightarrow -1} g(x) =$

11.  $\lim_{x \rightarrow e^+} g(x) =$

9.  $\lim_{x \rightarrow -5} f(x) =$

12.  $\lim_{x \rightarrow e} g(x) =$

### Special Trig Limits:

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = \quad \text{or} \quad \lim_{x \rightarrow 0} \frac{x}{\sin x} =$$

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x} = \quad \text{or} \quad \lim_{x \rightarrow 0} \frac{\cos x - 1}{x} =$$

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

14.  $\lim_{x \rightarrow 0} \frac{\tan 4x}{8x}$

15.  $\lim_{x \rightarrow 0} \frac{\cos^2 x - 1}{x(\cos x + 1)}$

16.  $\lim_{x \rightarrow 0} \frac{\sin 7x}{\sin 9x}$

Now summarize what you learned!

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