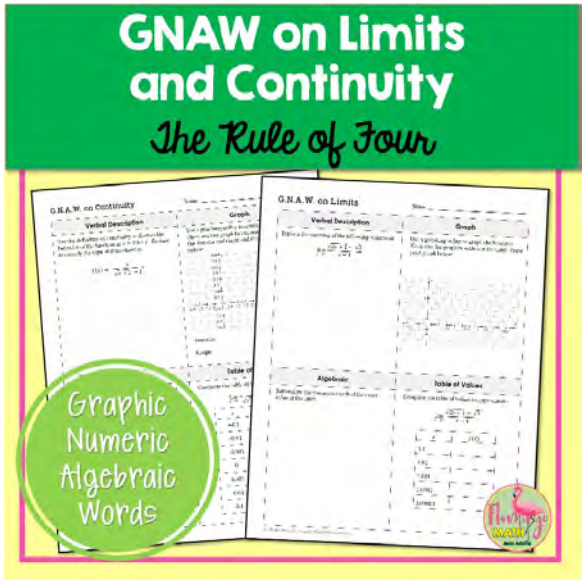


GNAW on Limits and Continuity

Your AP Calculus students will use the Rule of Four to explore limits and continuity.

College Board® Topics:

Topic 1.3: Estimating Limit Values from Graphs
Topic 1.4: Estimating Limit Values from Tables
Topic 1.6: Determining Limits Using Algebraic Manipulation
Topic 1.10: Exploring Types of Discontinuities

What is GNAW and the Rule of Four?

The "Rule of Four" or G.N.A.W. Approach is a method of thinking about mathematics in order to make connections through multiple representations of our mathematical thinking. Students should be able to represent mathematics in graphic, numeric, algebraic, and verbal formats. G.N.A.W.

Why should you use the GNAW approach?

By implementing this process into your classes, students will gain a deeper understanding of the mathematics. The Rule of Four helps students connect and validate concepts and techniques.

How can you use the Rule of Four?

Teachers can model this approach during instructional time to set the "tone" for expected thinking and reasoning. Then, give your students many chances to practice the techniques. It is also important that students learn to make connections between the different representations.

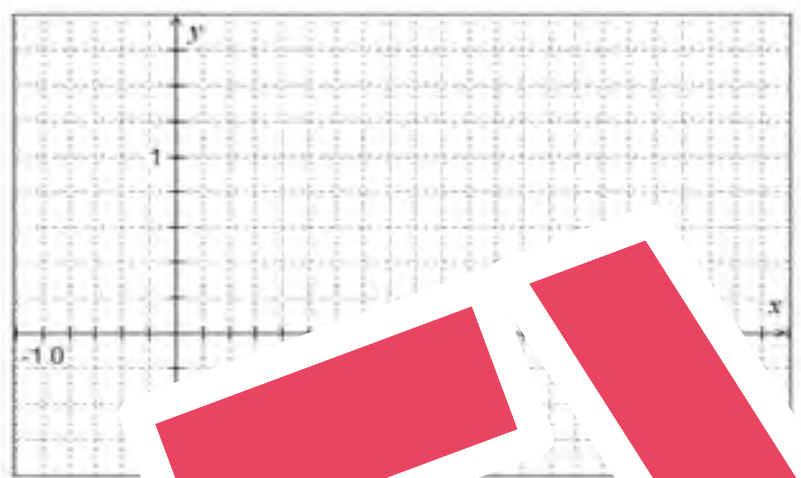
Guided Notes

PREVIEW

G.N.A.W. on Limits

Name ______________________________

Verbal Description	Graph
Explain the meaning of the following statement: $\lim_{x \to 1^+} \frac{\sqrt{2x+1} - \sqrt{3}}{x-1}$	Use a graphing utility to graph the function. Then, use the graph to estimate the limit. Draw your graph below:



Ratio ... ume ... th ... value ...

... e tal ... imate

$\lim_{x \to 1^+}$ ... $\sqrt{3}$

x	f(x)
1.1	
1.01	
1.001	
1.0001	
1.00001	

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G.N.A.W. on Continuity

Name ______________________________

Verbal Description	Graph
Use the definition of continuity ... ss behavior of the function ... e s to classify the ty ...	... a graphing utility to grap ... n. ... use the graph to estima ... State ... ain and ran ... dra ... h



Rationali ... tor to find the exact value of th ...

$$\lim_{x \to 0} \frac{x}{\sqrt{x+1} - 1}$$

Table of Values

Complete the table of values to approximate

$$\lim_{x \to 0} \frac{x}{\sqrt{x+1} - 1}$$

x	f(x)
−0.1	
−0.01	
−0.001	
0	
0.001	
0.01	
0.1	

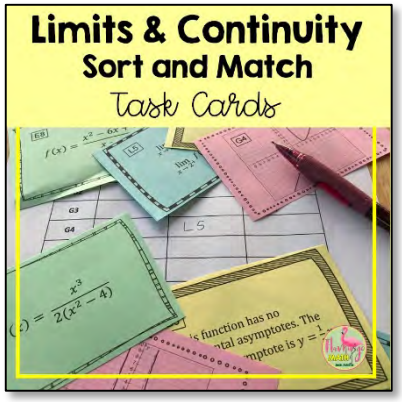
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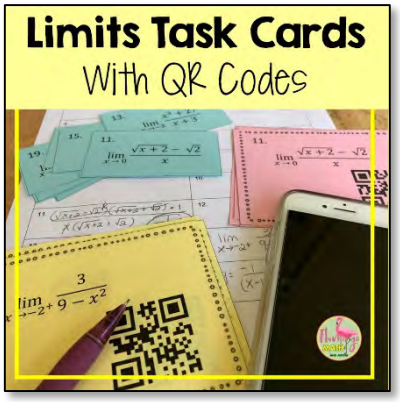


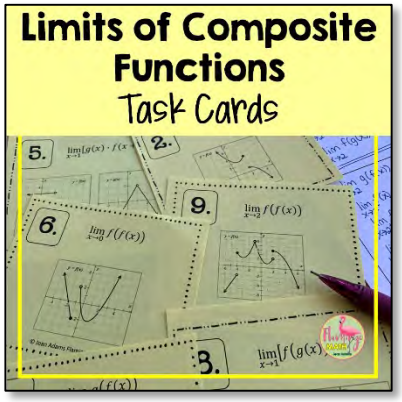
My goal is to help you bring balance into your teacher life by providing relevant content, engaging activities, and comprehensive assessments for your high-stakes math course.

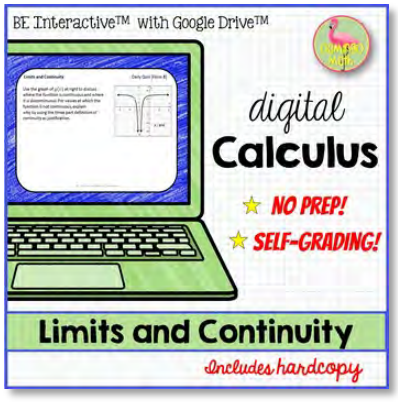
Jean

More Resources for YOU









Let's keep in touch! I'm here for you!

TPT

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NEWS LETTER