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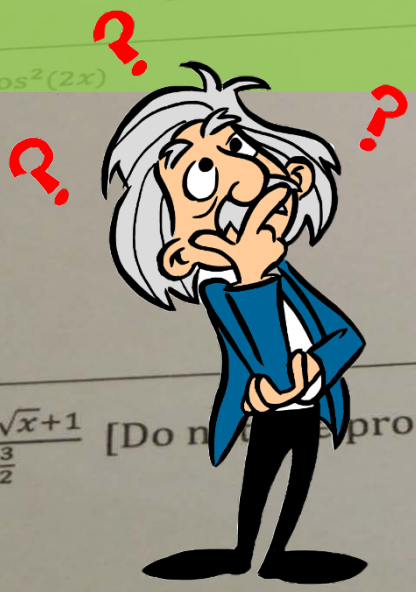
GATEWAY Skill-Builder Derivatives



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GATEWAY SKILL-BUILDER DERIVATIVES

The "GATEWAY SKILL-BUILDER" strategy will help students work toward quarterly goals. This activity promotes growth mindset by allowing students a safe environment where students can struggle as part of the learning process. These timed quizzes will help students improve their ability to recall basic skills. Used in a school-wide vertical teaming approach, future course teachers will spend less time in review. Here is a mini-set of 4 to get you started, directions for how to implement the strategy an editable template and all answer keys.

The Basics:
Each quarter, pick a skill, concept, or computational drill for students to master by the end of the grading period.

- ❑ Provide one practice set as a study guide
- ❑ Offer three in-class timed attempts
- ❑ Require a perfect score
- ❑ Allow either before school or after school time for those who need more opportunities.

BONUS: ***There is also an editable version included to help you create unlimited timed sets.***

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Positive Benefits in Future Coursework:

If you can implement these "Gateway Skill-Builder" sets in a vertical teaming effort within your school, your students' knowledge base will improve and teachers for each course afterward will have fewer review days.

The Rationale:

1. A strategy to help students learn important math facts.
2. GATEWAY Skill-Builders provide a safe approach which will allow students room to struggle while providing a pathway to success.

The Big Idea:

1. Create a 10-15-minute timed skill-set for each quarter.
2. Require students to make a perfect score.
3. Use the Skill-Builder set as a quiz grade.

Time Involved to Complete:

1. Using this strategy will take about 100 minutes of instructional time each quarter.
2. One practice day, with time to work through the solutions, and then three different timed sessions, of 10-15 minutes each, every two days. If you start the set by the second week of a grading period, students have plenty of opportunities to master the skills.

Implementation:

1. Start with a Practice Gateway, you may want to have students work together in a group on this first attempt. When time is called, work through each question to provide correct answers and discuss concepts that might lead to incorrect answers.
2. Have students keep this practice set as a study aid.
3. Two days later provide the first timed quiz to master the skills. If they do pass on this first try, you may offer a bonus of 105% as a quiz grade.
4. Then, two days later they will have another try for 100%.
5. Finally, there is one more "in-class-timed-event" to make a perfect score.
6. After the three class sessions, students may attempt the Gateway either before or after school. On average, it takes most students between 5-8 attempts for perfection.

Time-Saver Grading Technique:

1. After time is called, ask if anyone believes they may have a chance for a perfect score to surrender their paper.
2. Then, all pencils must be put away and a red or green pencil to grade is needed. NO EXCEPTIONS!
3. Display the answer key or call for answers.
4. Be sure to have students record a score on their paper and turn the graded paper in.
5. Do not allow students to keep these graded attempts.
6. Every now and then it becomes necessary to record the highest score for some students who haven't stepped up to the challenge.

Future Plans for After School Options:

1. It is best to create 10 - 15 versions for any given skill set to provide options for students to attempt a perfect paper.
2. Choose a deadline for any last chance about a week before the end of the quarter for procrastinators.

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Derivatives GATEWAY - Practice Differentiate, assuming k is a constant.	Name:
1. $y = 2x \cdot \sin(4x^2)$	2. $y = \sin^2(3 - \ln x)$
3. $y = \dfrac{2x^2 - 1}{x^2 + 3}$ Use quotient rule, simplify.	4. $y = \arcsin(-3x^2)$
5. $y = \sqrt{5x^2 + k^2}$	6
7. $y = \pi^{3x} + \arctan \pi - (\arctan x)^{\pi}$ DO NOT simplify.	8

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DERIVATIVES GATEWAY- 1 Differentiate, assuming k is a constant.	Name:
1. $y = \sqrt{2x + x^2}$	2. $y = \sin^4(2x + 5)$ [Do not simplify, just take the derivative.]
3. $y = \tan^{-1}(\pi^x)$	4. $y = \ln(\cos x) + x^2(\tan x)$ [Simplify completely!]
[illegible]	6. [illegible] $+ e^{\ln(3x)} + k^k$
[illegible] $y = \dfrac{x^7 + \sqrt{x} + 1}{x^5}$ [Do not use product or quotient rule!]	8. $y = \dfrac{e^x}{x^2}$ [Factor and simplify completely!]

DERIVATIVES GATEWAY- 2 Differentiate, assuming k is a constant.	Name:
1. $y = \tan\sqrt{2x}$	[illegible] $y = \pi^x + \sin^{-1}$ [illegible] π^{π}
3. $y = (e^{kx^2})(2^{kx})$ [Factor and simplify]	[illegible] $y = \ln($ [illegible] $4x^4)$
5. $y = \sin^2\left(\frac{3}{x^2}\right)$	
7. $y = \sec(3x) - \sin(3x^2) + \sqrt[3]{x^2}$	

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DERIVATIVES GATEWAY- 3 Differentiate, assuming k is a constant.	Name:
1. $y = \frac{3x^3 + 2x - \sqrt{4x}}{x^2}$	2. $y = \tan(e^{kx}) + \ln(kx^2) + \sec(kx)$
3. $y = \sin^3(2x - x^2)$	4. $y = \frac{1}{\sqrt{x^2 + k^2}}$ [No quotient rule here!]
5. $y = \arctan(5x^2)$	6. $y = 2x \cdot 2^{2x} \cdot x$
7. $y = 3\ln x + (\ln x)^4 - 3\pi x + \pi^x$	8. $y = \pi e^{3x} - e^{3x} + \ln e^{x^2}$

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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.

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