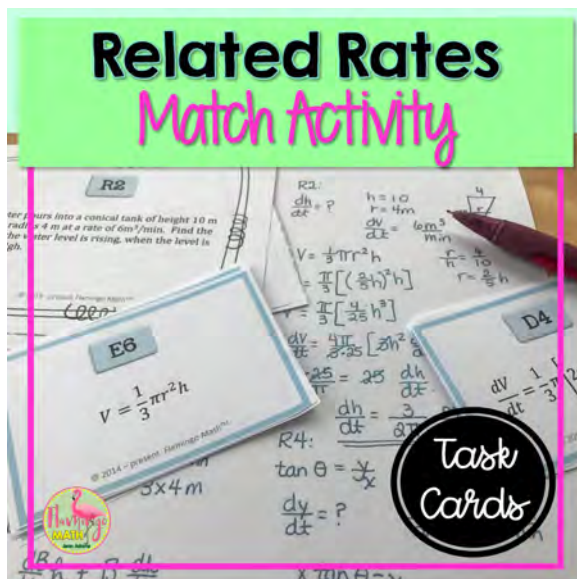




Related Rates Sort & Match Activity

Your AP Calculus students will be actively engaged in this fun Sort & Match Task Cards Activity as they review for related rates.

This **Related Rates Sort & Match Activity** is designed for AP Calculus AB students. The concepts will help your students work through the rules for setting up problems on topics of implicit differentiation with respect to time, (including Chain Rule), and solving the basic types of related rates problems.

There are eight task cards to present a typical related rate situation. Students will match the task card with the question, to an equation task card, and its related derivative card. When students are finished with this portion, have them complete the activity by listing the unknown in each question, stating the givens, then solving the problem for each situation. A student recording sheet for matching is provided, as well as a separate sheet for showing work to solve each related rate prompt.

Teaching Suggestions

You may use these task cards as:

- a group quiz activity for 2-4 per group
- a review activity prior to assessing students
- a math station in a math workshop setting



Task Card Sort and Match

PREVIEW

E1 $x^2 + y^2 = z^2$ © 2014 – present Flamingo Math™	E2 $V = Bh$ © 2014 – present Flamingo Math™	D1 $\frac{dV}{dt} = \pi r^2 \frac{dh}{dt}$ © 2014 – present Flamingo Math™	$-r \frac{ds}{dt} = \frac{dx}{dt}$ © 2014 – present Flamingo Math™
E3 $x \tan \theta = y$ © 2014 – present Flamingo Math™	E4 $\pi r^2 h$ © 2014 – present Flamingo Math™	$\frac{dA}{dt} = \pi r \frac{dr}{dt} + \pi r^2 \frac{d\theta}{dt}$ © 2014 – present Flamingo Math™	$r^2 \frac{dh}{dt}$ © 2014 – present Flamingo Math™
E5 $\frac{dx}{dt} = \frac{y}{r}$ © 2014 – present Flamingo Math™	E8 $V = \pi r^2 h$ © 2014 – present Flamingo Math™	D7 $\tan \theta \frac{dx}{dt} + x \sec^2 \theta \frac{d\theta}{dt} = \frac{dy}{dt}$ © 2014 – present Flamingo Math™	D8 $\frac{dV}{dt} = 4\pi r^2 \frac{dr}{dt}$ © 2014 – present Flamingo Math™

Task Card Sort and Match

R1

Assume the radius r of a sphere is expanding at a rate of 12 in/min. Find the rate at which the volume is changing with respect to time when $r = 5$ in.

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R2

Water pours into a conical tank of height 10 m and radius 4 m at a rate of $6\text{ m}^3/\text{min}$. Find the rate the water level is rising, when the level is 5 m high.

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R3

Water pours into a fish tank at a rate of $0.2\text{ m}^3/\text{min}$. How fast is the water level rising when the base of the tank is a rectangle of 4×4 meters?

... rising vert...
... located 2 miles fr...
... a certain moment,
... observer's line of sig...
... and is changing at...
... a balloon

5

Kevin ar... nt... ladder...
upstairs against th... ladder is slipping so...
that its bas... away from the wall at a rate...
of 3 ft/sec. How fast is the angle formed by the...
ladder and the ground decreasing when the...
ladder's base is 9 ft. from the wall?

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R6

Sonia and Sana are in speedboats located at the center of Lake Down. At time $t = 0$ minutes, Sonia begins to travel north at a speed of 30 mph and Sana travels east at a speed of 26 mph. At what rate is the distance between them increasing when $t = 12$ minutes?

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R7

The height of a cylinder with a radius of 6 cm is increasing at a rate of 2 cm/min. Find the rate of change of the volume with respect to time when the height is 14 centimeters.

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R8

Oil spilled from a tanker is spreading in a circle whose area increases at a constant rate of 8 square miles per hour. How fast is the radius of the spill increasing when the area is 16 square miles?

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Student Recording Sheets

Related Rates Lab Activity

Name _____

Date _____ Period _____

Part 1: Complete the table to record your matches.

Related Rate Problem	General Equation	Derivative
R1		
R2		
R3		
R4		
R5		
R6		
R7		
R8		

Part 2: For each problem, complete the following:

- Determine the units of each variable.
- List the variables that are constant, and the variables that are changing.
- Solve the problem.

Related Rates Lab Activity

Name _____

R1	E#	D#	R2	E#
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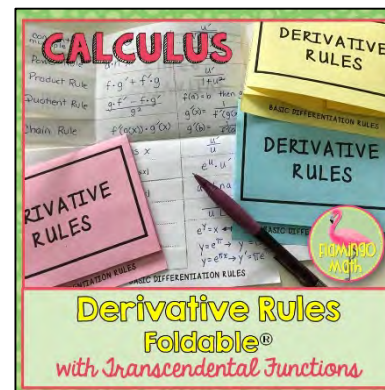
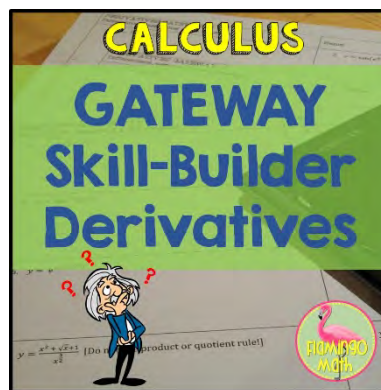
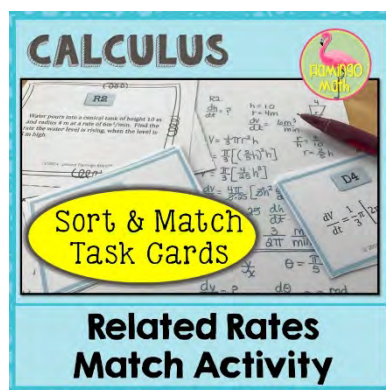
R5	E#	D#	R6	E#



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!



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