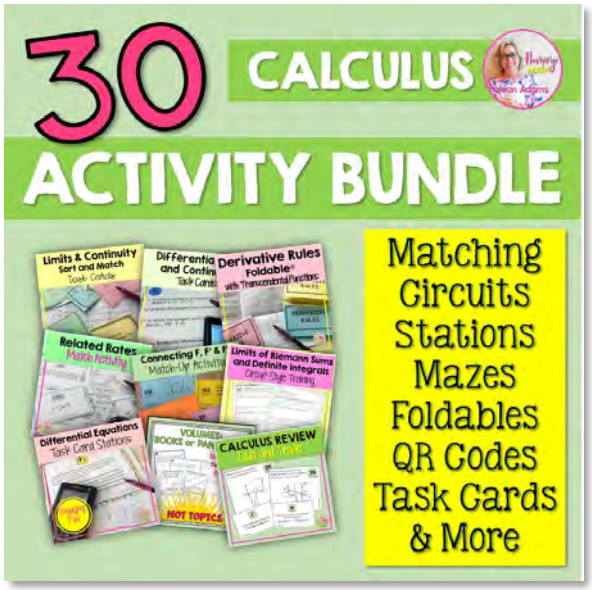


AP CALCULUS AB ACTIVITIES BUNDLE

This resource is a full-year bundle of 30 cooperative classroom activities for your AP Calculus AB course.

AP Calculus Full-Year Activity Bundle:

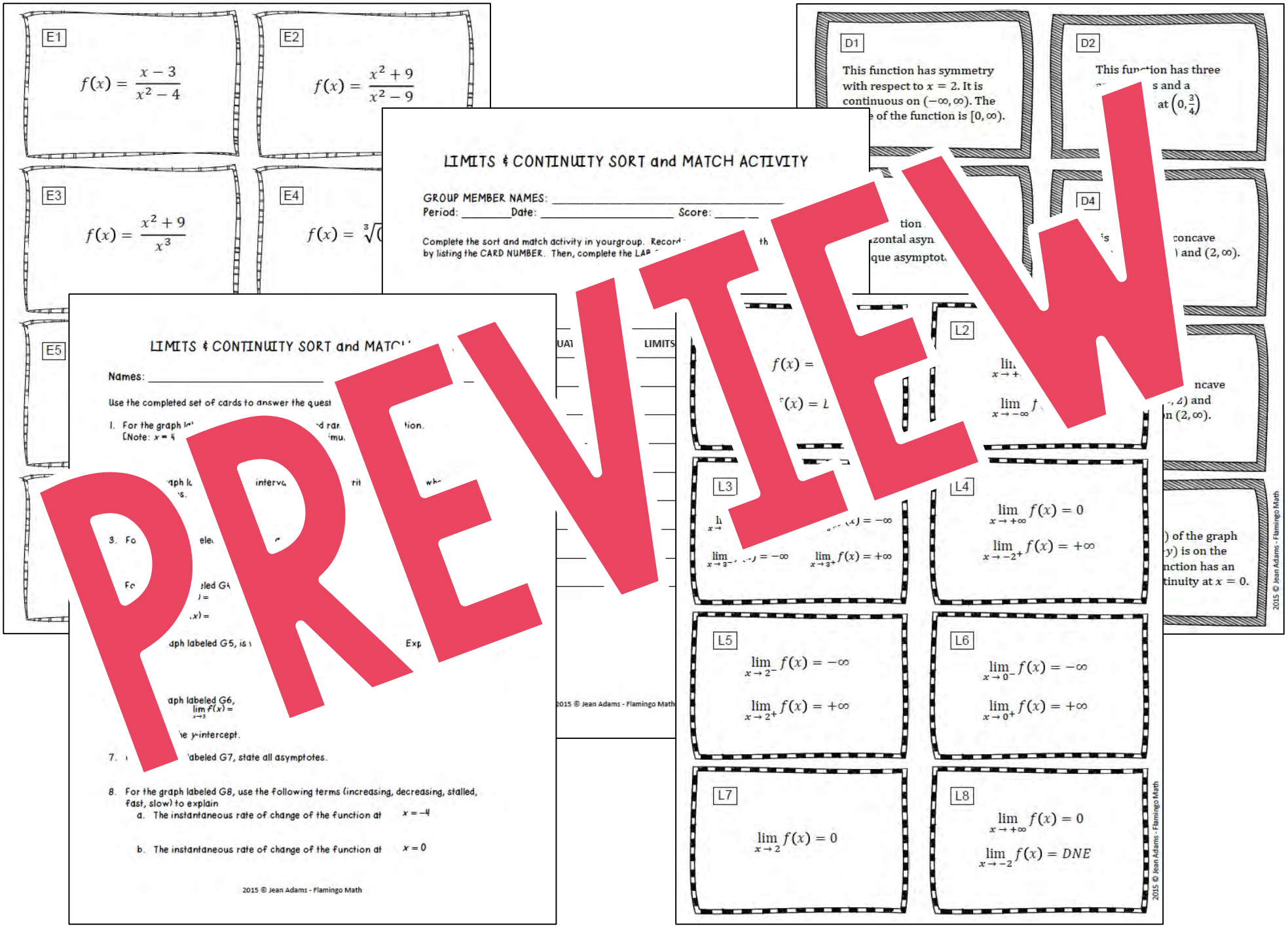
WOW! Here is a full-year resource bundle of 30 fun and engaging cooperative Calculus Activities that will keep your students involved throughout the entire course. The bundle is a complete collection of activities from my **AP Calculus Curriculum MEGA Bundle.**

What is included in this resource?

The bundle includes a wide variety of learning strategies that have been student-tested and teacher-approved. There are task card activities, some with QR Codes for self-checking appeal, sort and match activities, mazes, Station Card activities, HOT TOPIC Infographics, foldables, and more.

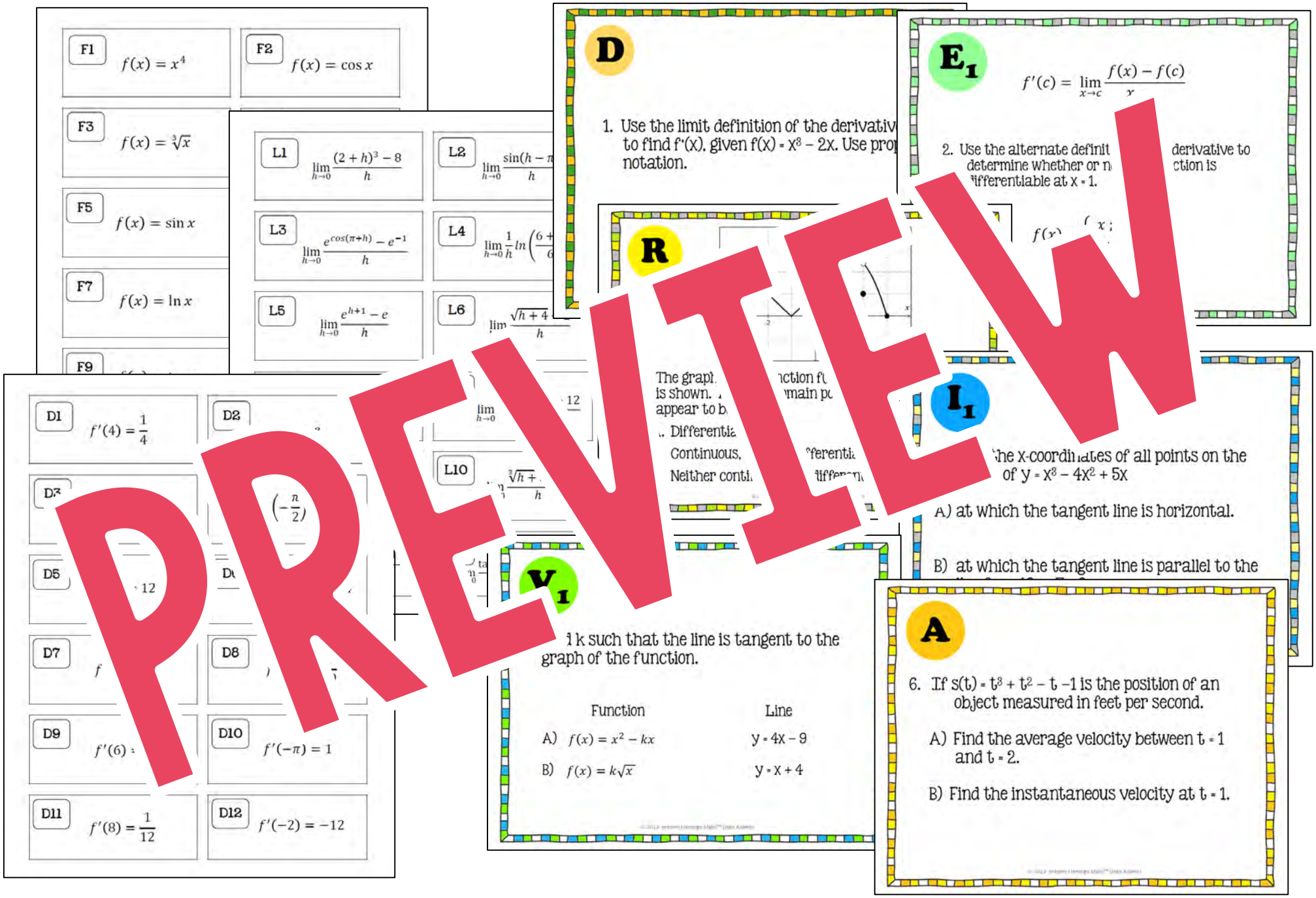
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Activities



PREVIEW

Activities



PREVIEW

T

7. Find the derivative, simplify so th
are no negative exponents.

A) $f(x) = 3\sqrt[4]{x}$

B) $y = \frac{2}{x} - 4\cos x$

C) $g(x) = 4\sqrt{x} - 9\sqrt[3]{x}$

D) $h(x) = \frac{6}{\sqrt[3]{x}} + 3\cos x$

I_2

8. Use the product rule to differentiate:

A) $g(x) = x^3 \cos x$

B) $f(x) = \sqrt{x}\sin x$

C) $h(t) = t^2 \sin t$

D) $f(\theta) = (3\tan\theta)(\theta^2 - 2\cdot$

V_2

9. Use the quotient rule to differentiate:

A) $f(x) = \frac{\sin x}{x^2}$

B) $g(x) =$ $\frac{-5}{^2+3}$

(x) $\frac{3}{}$

E_2

10. Use th ule ifferentiate:

A) $y = ($

B) $f(x) =$ $x^{\cdot}$

C) $y = 3t$)

D) $g(\theta) = \frac{1}{4}\sin^2(2\theta)$

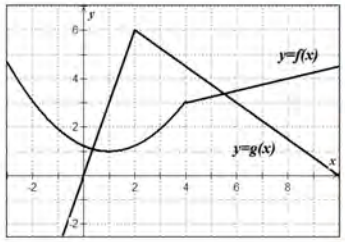
S

11. Consider the functions f and g. If h= f ∘ g:

A) Find h'(1)

B) Find h' (0)

C) Does h'(2) exist?



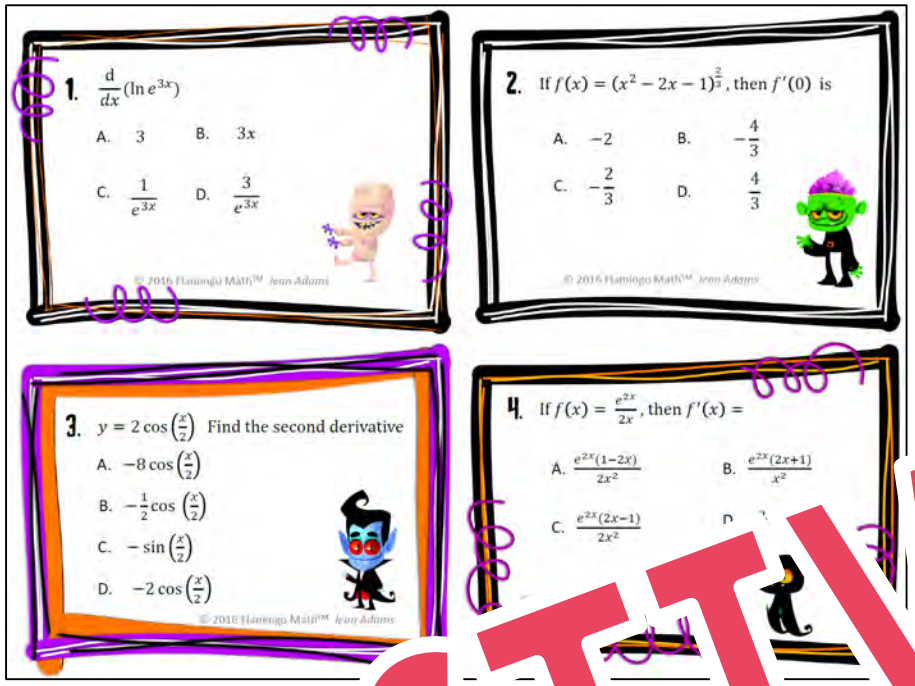
Continuity Stations Name

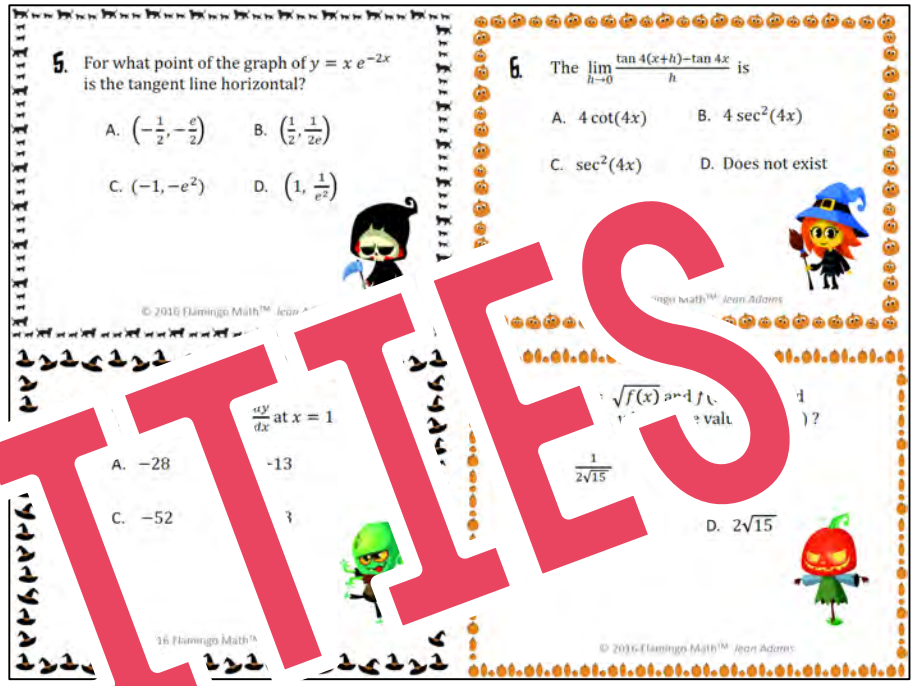
D	
E_1	2.
R	3A.
I_1	4A.
V	5A.
A	6A.

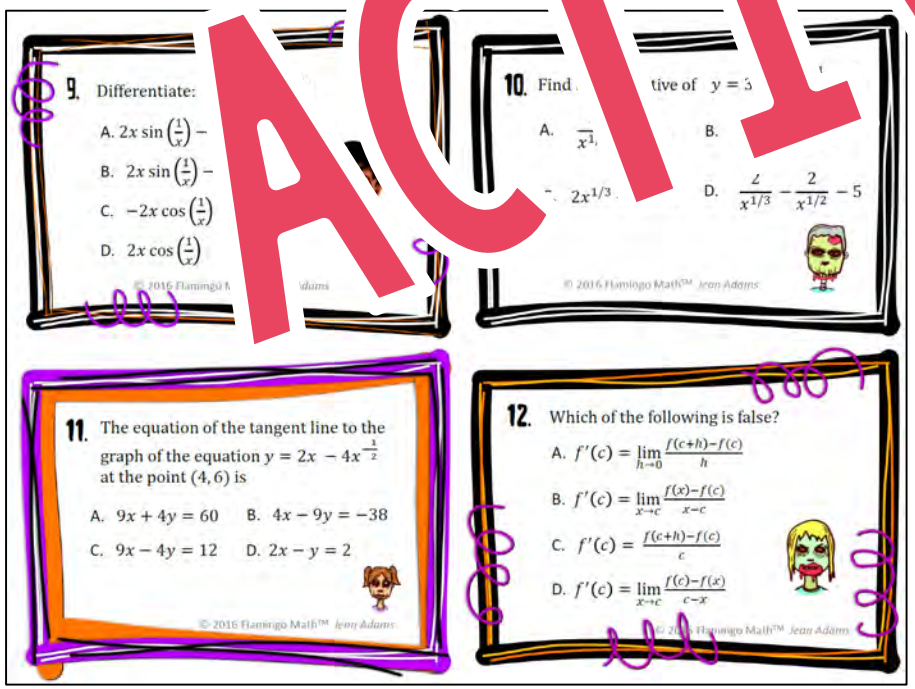
T	7A.	7B.
	7C.	7D.
I_2	8A.	8B.
	8C.	8D.
V	9A.	9B.
	9C.	9D.
E_2	10A.	10B.
	10C.	10D.
S	11A.	11B. 11C.

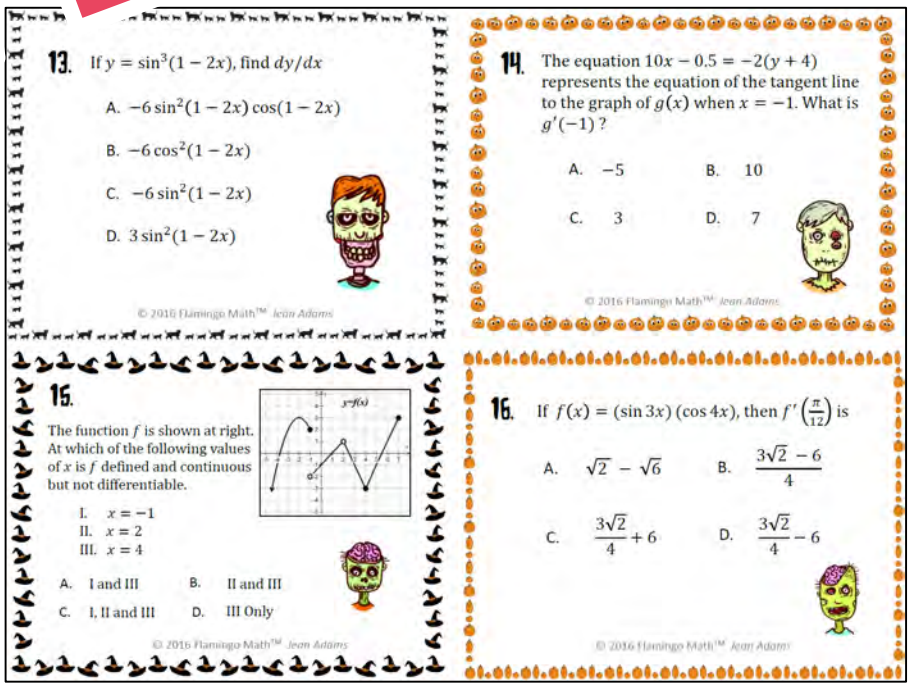
ACTIVITIES

Activities

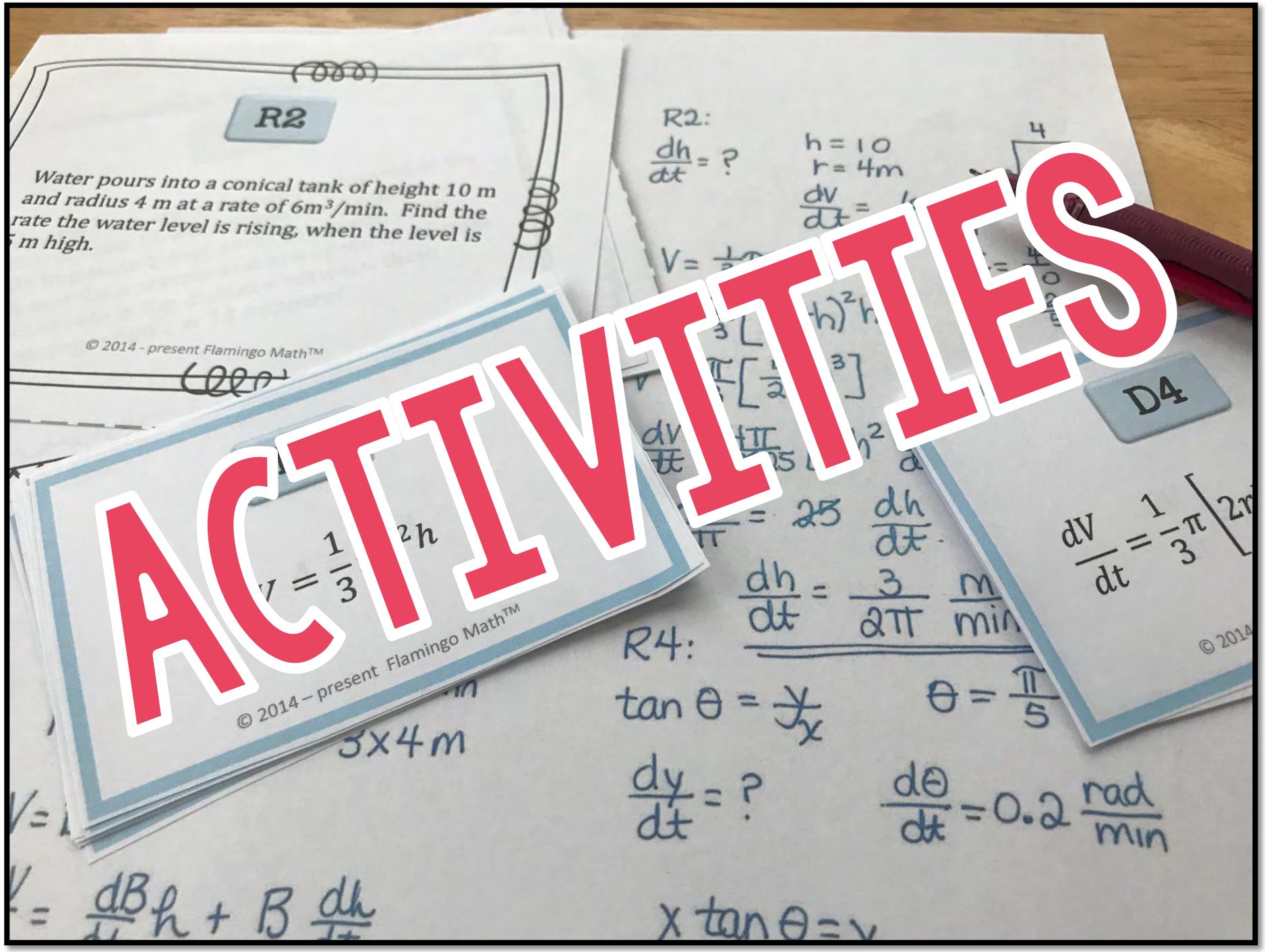




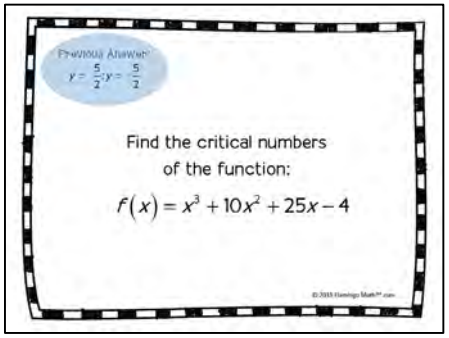


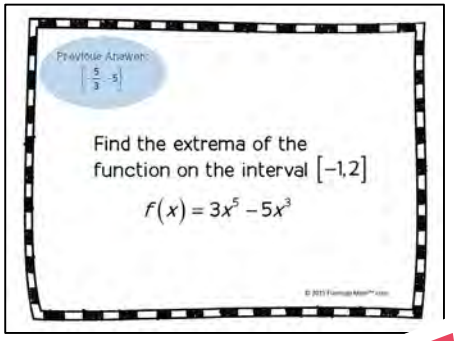


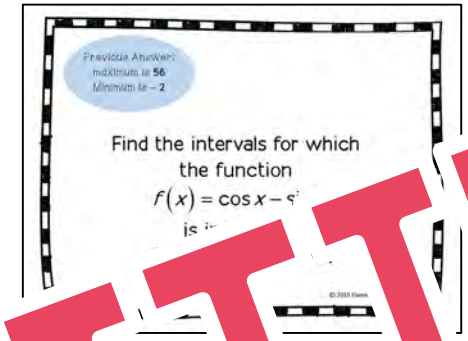
ACTIVITIES

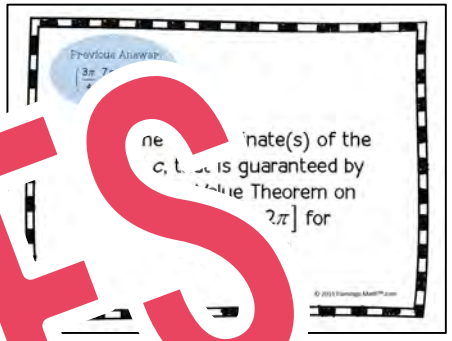

R2
Water pours into a conical tank of height 10 m and radius 4 m at a rate of 6m³/min. Find the rate the water level is rising, when the level is m high.
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R2:
h = 10
r = 4m
3x4m
R4:
tan θ = y/x
dy/dt = ?
dθ/dt = 0.2 rad/min
D4
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ACTIVITIES

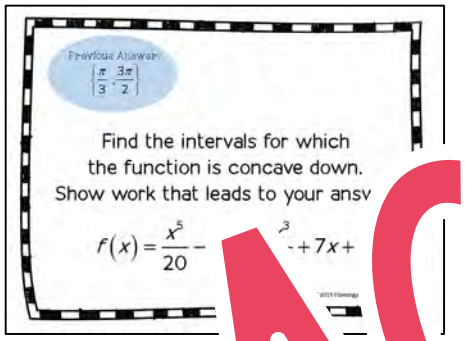
Activity

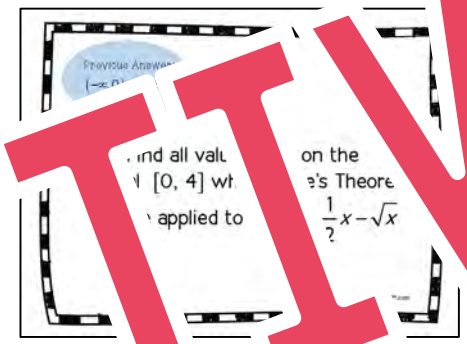


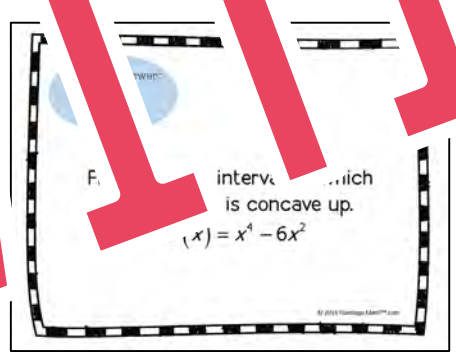


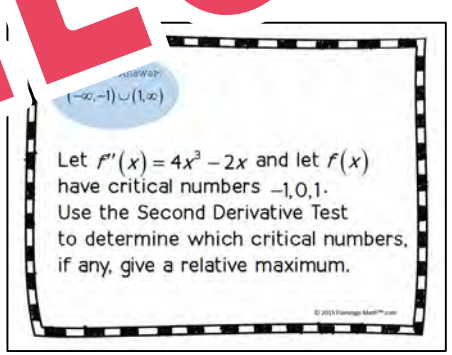


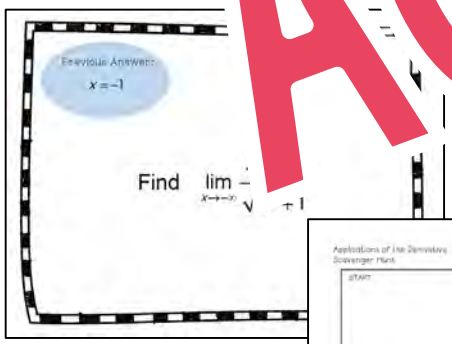


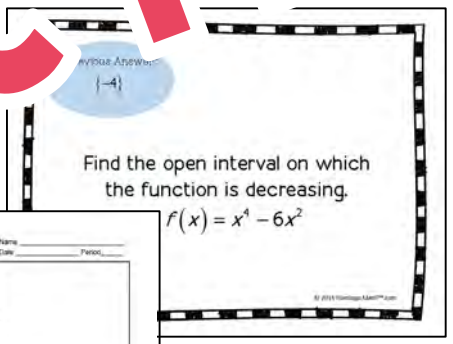


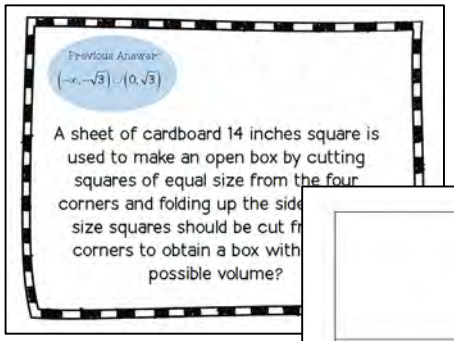


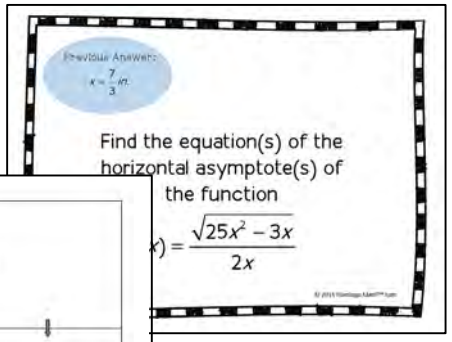


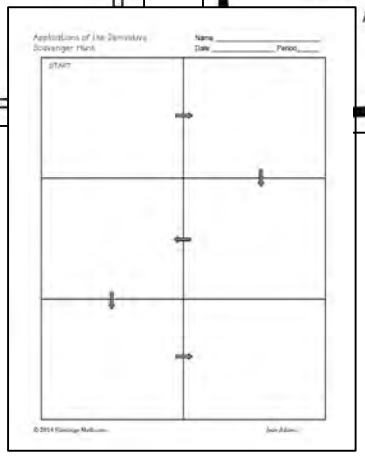


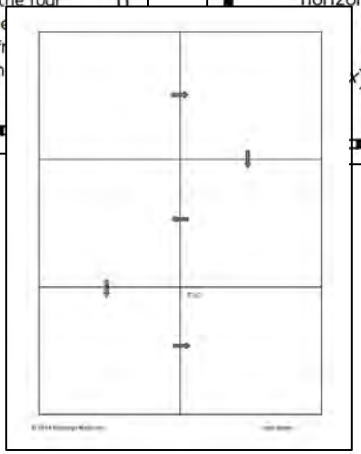






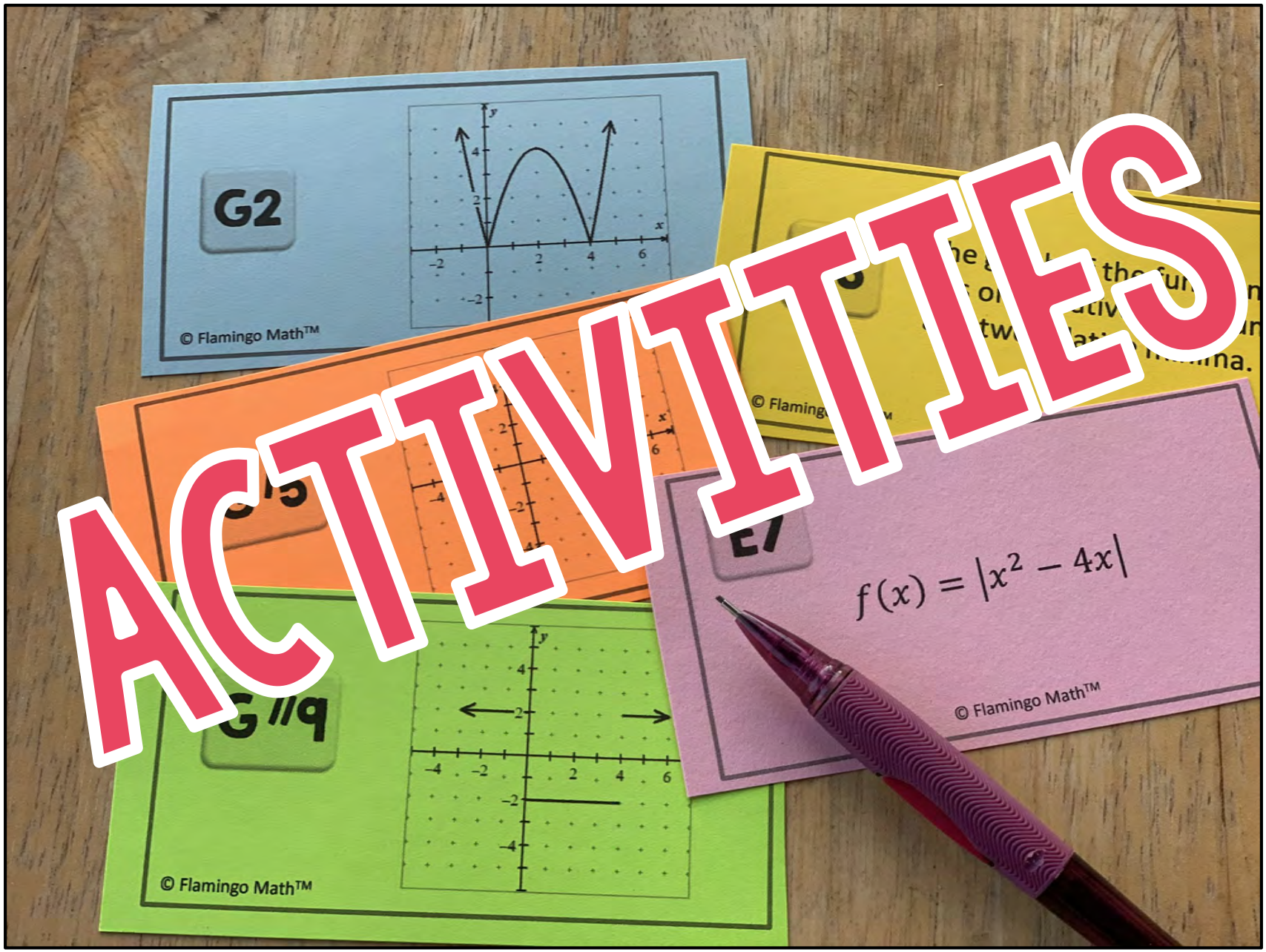






ACTIVITIES

Activity

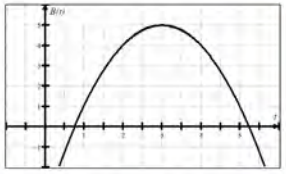


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I1

Find the area under the curve of the graph from [1, 5] given $y = -x^2 + 6x - 4$ using n = 4 subintervals and

1. left endpoints
2. right endpoints
3. midpoints



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N1

4. The rate at which water flows out of a drain pipe in gallons per hour, is given by a differentiable function R of time t. The table below shows the rate as measured every 3 hours for a 24-hour period.

A. Use a trapezoidal approximation with 4 sub-inter… equal length to find $\int_0^{24} R(t)\,dt$

B. Using correct units, writ… your answer in terms of …

		3		12	15		24	
			10	1.4	10.8		8.4	

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T1

…d the … …gral:

$\int \frac{1}{+4}\,dt$

$\int \frac{\cdot^2-3}{} \cdot 1$

$\int (\sin\theta)\,d\theta$

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E

8. For a school ye… yo… …e (percent) for day 1 throu… …le… …function … $(x) =$ …

Find your avera… …h… Write what you … …inte… …cula… your work.

9. Find the value(s) … …ranteed by the Mean Value Theorem for …ntegrals for $f(x) = \frac{9}{x^3}$ on the interval $[1, 3]$.

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C

…g indefinite integral.

10. $\int (3\sin^5\theta\cos\theta)\,d\theta$

11. $\int \frac{x^4 - 2x^3}{x^5}\,dx$

12. $\int \frac{e^{1/x}}{x^2}\,dx$

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R

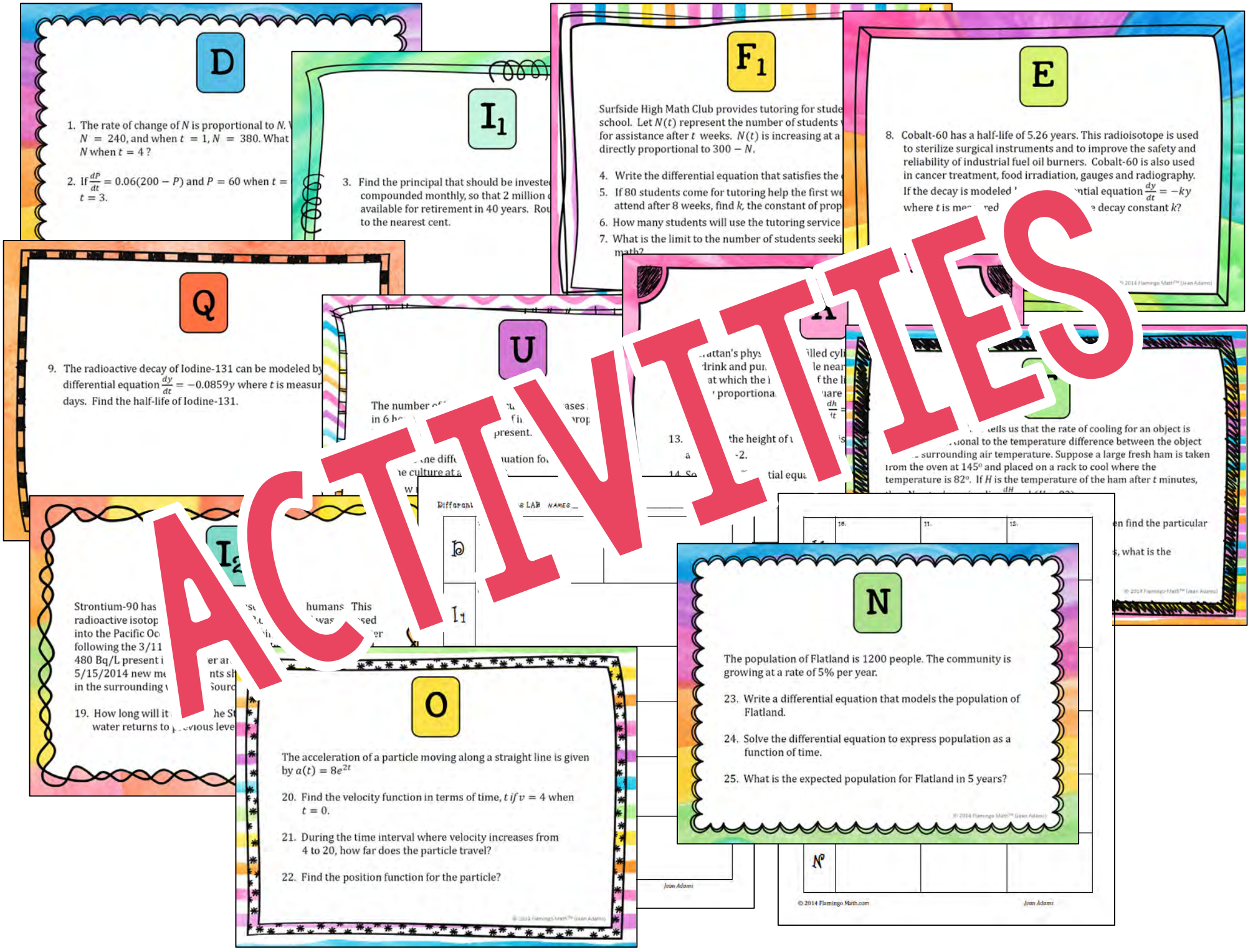
A particle moves along the x-axis so that its velocity at any time t is given by $v(t) = t^2 - 8t + 12$. At time $t = 1$ the position of the particle is $s(1) = 8$.

13. Find the position function for the particle.
14. Find the acceleration function for the particle.
15. On what interval(s) is the particle moving left?
16. On what interval(s) is the particle speeding up?
17. Find the displacement of the particle when it travels from $t = 0$ to $t = 7$.
18. Find the total distance the particle travels from $t = 0$ to $t = 7$, given that the particle is still at $t = 2, 6$.

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ACTIVITIES

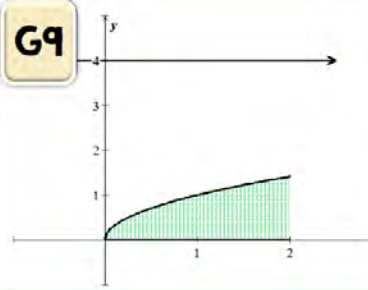

ACTIVITIES
Integration Maze . . . definitely
Directions: Find the solution to each definite integral and solve the maze. SHOW YOUR WORK!
START:
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D
1. The rate of change of N is proportional to N.
$N = 240$, and when $t = 1, N = 380$. What
N when $t = 4$?
2. If $\frac{dP}{dt} = 0.06(200 - P)$ and $P = 60$ when $t =$
$t = 3$.
I1
3. Find the principal that should be investe
compounded monthly, so that 2 million
available for retirement in 40 years. Rou
to the nearest cent.
F1
Surfside High Math Club provides tutoring for stude
school. Let $N(t)$ represent the number of students
for assistance after t weeks. $N(t)$ is increasing at a
directly proportional to $300 - N$.
4. Write the differential equation that satisfies the
5. If 80 students come for tutoring help the first w
attend after 8 weeks, find k, the constant of prop
6. How many students will use the tutoring service
7. What is the limit to the number of students seeki
math?
E
8. Cobalt-60 has a half-life of 5.26 years. This radioisotope is used to sterilize surgical instruments and to improve the safety and reliability of industrial fuel oil burners. Cobalt-60 is also used in cancer treatment, food irradiation, gauges and radiography. If the decay is modeled
ntial equation $\frac{dy}{dt} = -ky$
where t is me red
decay constant k?
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Q
9. The radioactive decay of Iodine-131 can be modeled by
differential equation $\frac{dy}{dt} = -0.0859y$ where t is measur
days. Find the half-life of Iodine-131.
U
The number
in 6 h
present.
ases
rop
ne diff
uation fo
e culture at a
w
H
attan's phys
drink and pur
at which the
proportiona
illed cyl
le near
f the l
uare
$\frac{dh}{t}$
13.
the height of
a
-2.
14. So
tial equa
Different
LAB NAMES
b
l_1
I2
Strontium-90 has
radioactive isotop
into the Pacific Oc
following the 3/11
480 Bq/L present i
5/15/2014 new m
in the surrounding
Sourc
humans This
was sed
er
19. How long will it
water returns to
he St
vious leve
O
The acceleration of a particle moving along a straight line is given by $a(t) = 8e^{2t}$
20. Find the velocity function in terms of time, t if $v = 4$ when $t = 0$.
21. During the time interval where velocity increases from 4 to 20, how far does the particle travel?
22. Find the position function for the particle?
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N
The population of Flatland is 1200 people. The community is growing at a rate of 5% per year.
23. Write a differential equation that models the population of Flatland.
24. Solve the differential equation to express population as a function of time.
25. What is the expected population for Flatland in 5 years?
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T
tells us that the rate of cooling for an object is
tional to the temperature difference between the object
surrounding air temperature. Suppose a large fresh ham is taken
from the oven at 145° and placed on a rack to cool where the
temperature is 82°. If H is the temperature of the ham after t minutes,
$\frac{dH}{}$
en find the particular
s, what is the
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18.
11.
12.
№
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Jean Adams
ACTIVITIES

ACTIVITIES

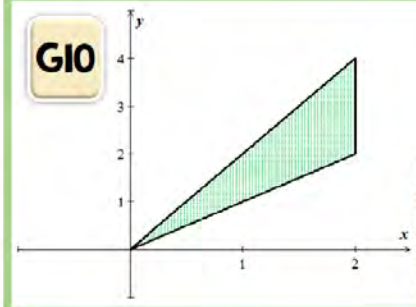


G9



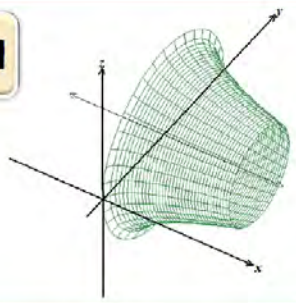
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G10



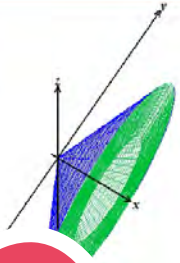
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G9



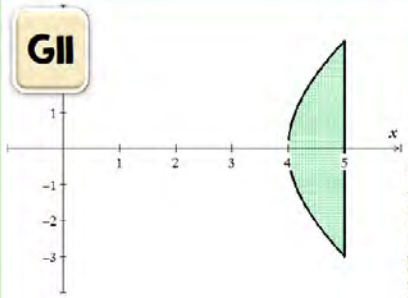
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G10



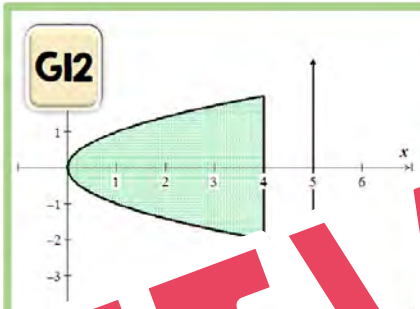
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G11



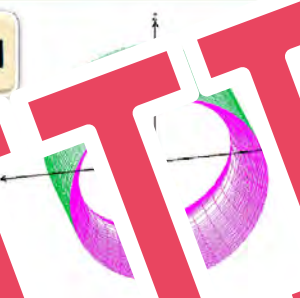
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G12



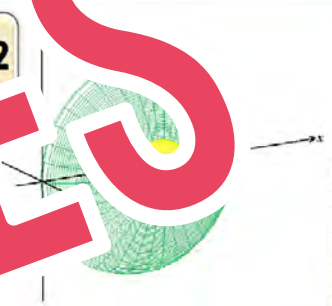
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G11



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G12



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E1

Revol… …e y

$y = x$…

$x =$ …

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E

…olve abou…

$y =$ …

$x = 4$

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E

Revolve about x-axis:

$y = \sqrt{9 - x^2}$

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E6

Revolve about line x=6

$x = y^2$

$x = 4$

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E3

Revolve about y-axis:

$x = y^{\frac{3}{2}}$

$y = 1$

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E4

Revolve about y-axis:

$x^2 - y^2 = 16$

$x = 5$

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Revol…

$x = \sqrt{y - 1}$

$y = 2$

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E8

Revolve about x-axis:

$y = 2x$

$y = x$

$x = 2$

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ACTIVITIES

TASK CARDS

Task Cards ACTIVITIES Task Cards

1.

Find the volume of the solid generated by revolving the region bounded by the curve $y = \sqrt{x}$, $y = 0$, and $x = 4$ about the x-axis.

A. 8π B. 6π

C. 4π D. $\frac{7\pi}{2}$

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2.

Find the volume of the solid generated by rotating the area bounded by $y = x^2$, $y = 2$ about the y-axis.

A. 4π B. π

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3.

Find the volume of the solid generated by revolving the region bounded by the curve $y = 2\sin(x)$, $y = 0$, and $x = \pi$ about the x-axis.

A. 2π B. $\frac{\pi}{2}$

C. $4\pi^2$ D. $2\pi^2$

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4.

Find th
revolvi
$y = \sqrt{x}$

5.

Find the volume generated by revolving the region bounded by $y = x^2$, $y^2 = 8x$ about the y-axis.

A. $\frac{128\pi}{15}$ B. $\frac{192\pi}{5}$

C. $\frac{24\pi}{5}$ D. $\frac{16\pi}{3}$

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6.

Find the volume generated by revolving the region bounded by $y = x^2$ and $y = 4 - x^2$ about the x-axis.

A. $\frac{64\pi\sqrt{2}}{3}$ B. 32π

D. $\frac{64\pi}{3}$

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7.

Find the v
ne base
xy-plane b
Find the vo
ection perp
osceles tria
d altitude e
d is the circ
by the circ
he solid if e
ar to the x-c
base on th
the length
n in
= 4.
ss

A. $\frac{64}{3}$

128

8.

d the
area b
nde
ed by rotating
^{3}, $x^2 + y = 0$
out

A. $\frac{2\pi}{5}$

$\frac{\pi}{3}$ D. $\frac{3\pi}{5}$

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9.

Find the volume
by ro
e
area bounded b
an
about the line x =

A. $\frac{16\pi}{5}$

C. $\frac{64\pi}{5}$ $\frac{1}{7}$

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10.

Find
the
and
A.
C.

d has it
plane bounde
graph
and $y^2 = x$. Find the
of the solid if every cross section
dicular to the x-axis is a semi-circle
with diameter in the xy-plane.

A. $\frac{\pi}{80}$ B. $\frac{\pi}{240}$

C. $\frac{\pi}{120}$ D. $\frac{128\pi}{15}$

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11.

Find the volume generated by revolving the region bounded by the graphs of $x = y^2$ and $x = 4$, about the line $x = 6$.

A. $\frac{464\pi}{5}$ B. $\frac{192\pi}{5}$

C. $\frac{424\pi}{5}$ D. $\frac{384\pi}{5}$

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12.

Find the volume generated by revolving the region bounded by the graphs of $y = x^2$ and $y = 4x - x^2$, about the line $y = 6$.

A. $\frac{128\pi}{15}$ B. $\frac{64\pi}{3}$

C. $\frac{32\pi}{3}$ D. 64π

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17.

The region in the first quadrant bounded between the graphs of $y = x$ and $y = 2\sin(x)$ is revolved about the x-axis. The volume of the solid generated is

A. 1.895 B. 2.126

C. 5.811

18.

If the region enclosed by the y-axis and the relation $x = 4 - y^2$ is revolved about the y-axis, the volume of the solid generated is

B. 53.617

D. 214.466

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19.

The base of a solid is the region enclosed by the graph of $y = 3(x - 2)^2$ and the coordinate axes. If every cross section perpendicular to the x-axis is a square, then the volume of the solid is

A. 19.2 B. 57.6

C. 24.0 D. 25.6

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20.

The base of a solid is the region in the first quadrant bounded by the x-axis, the y-axis, and the graph of $y = (3 - x)e^{-x}$. If cross sections of the solid perpendicular to the x-axis are squares. What is the volume of the solid?

A. 12.998 B. 10.208

C. 3.781 D. 3.249

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VOLUMES: Books or Pancakes? Name _____

Find the volume of the solid generated by rotating the region bounded by the given curves about the specified axis or line.

1. $y = 2x + 1$, $y = 0$, $x = 0$, and $x = 4$, about the x-axis

2. $y = x^3$, $y = 8$, and $x = 0$, about the y-axis.

3. $y = 9 - x^2$, $y = x^2$, and $x = 0$, about the x-axis.

4. $y = x^3$, $y = 4x$, and $y = 0$, about the y-axis.

5. $y = x^2$ and $y = 4$ about the line $x = 3$

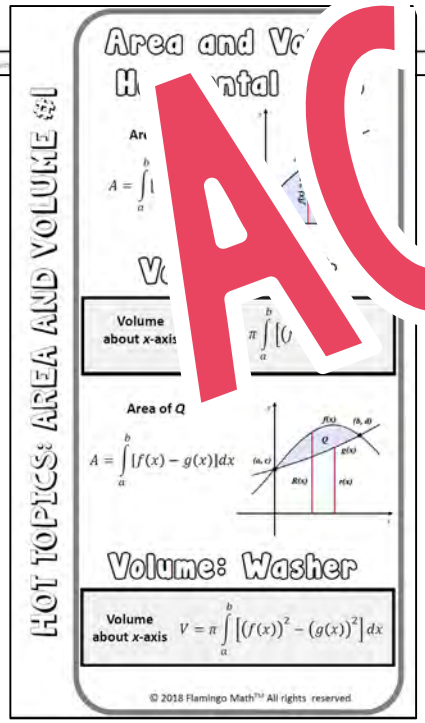
6. $y = x^2$ and $y = 4$ about the line $y = 5$

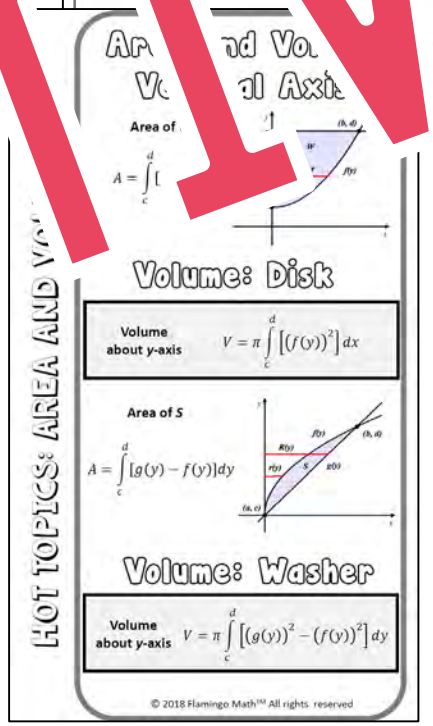
7. The base of a solid is the region bounded by the graphs of $x = y^2$ and $x = 4$. Each cross section perpendicular to the x-axis is a semicircle. Find the volume of the solid.

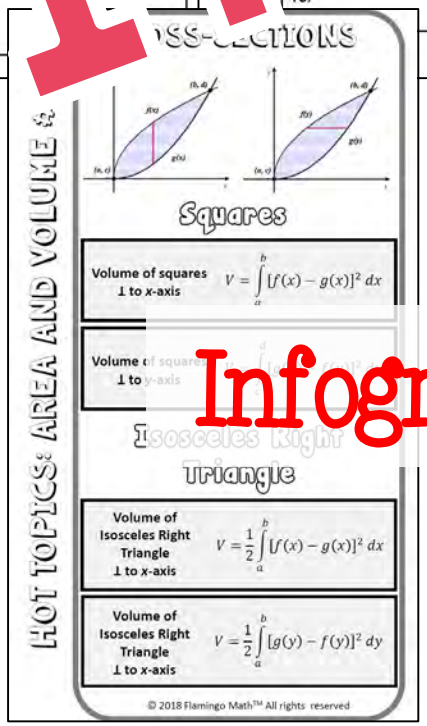
8. The base … the graph … and $x = 4$. … is an equilateral triangle. Find the …

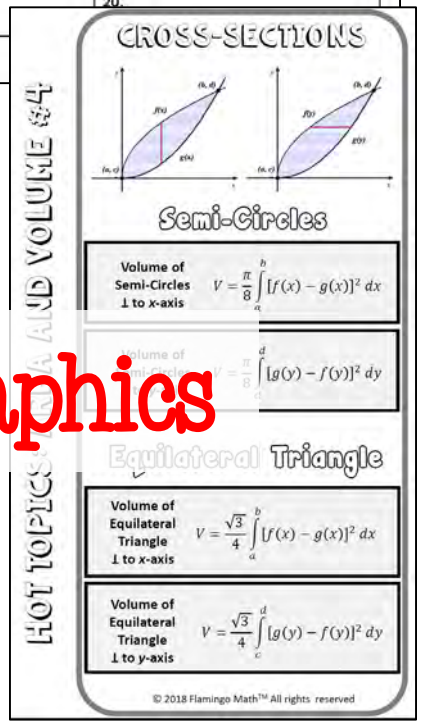
Volumes: Books or Panacakes? Name _____
Volumes Task Cards

1.	11.
2.	12.
3.	13.
4.	
5.	
7.	
8.	
9.	19.
10.	20.









Practice ACTIVITIES Infographics

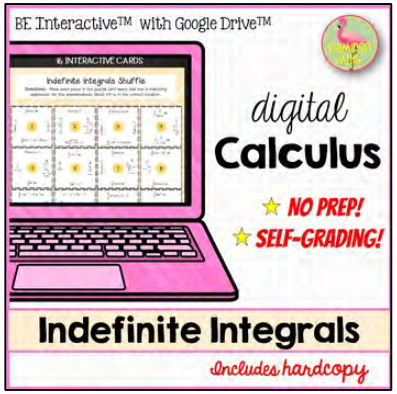
Preview individual lessons, activities, and assessments by clicking each preview button.

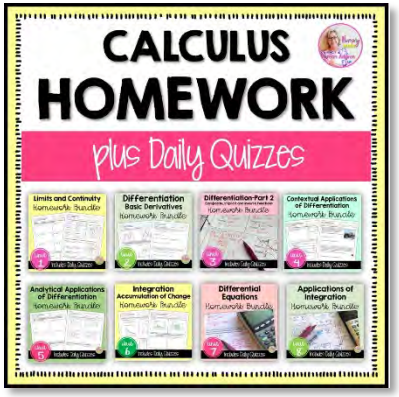


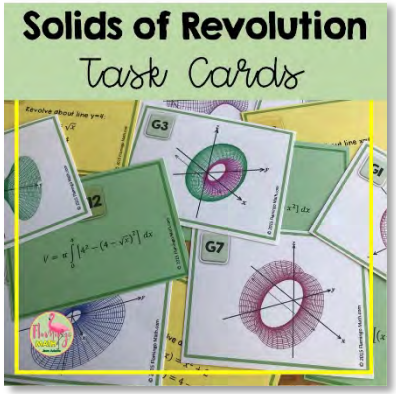
My goal is to help you bring balance into your teacher life by providing relevant content, engaging activities, and comprehensive assessments for your high-stakes math course.

Jean

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