

AP[®] Calculus

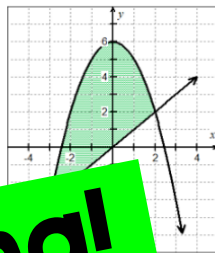
Applications of Integration



Question #1

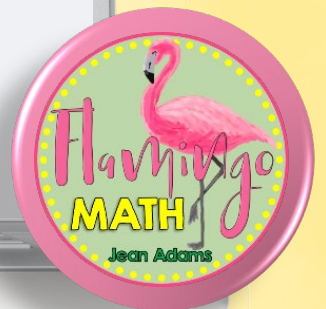
1

Find the area of the region bounded by the graphs of $y = 6 - x^2$ and $y = x$.

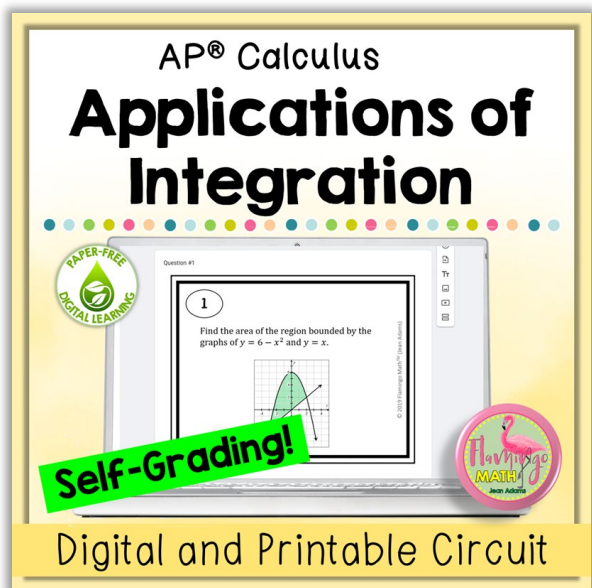


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Self-Grading!



Digital and Printable Circuit



AP Calculus Applications of Integration for Google™ Drive

Your AP Calculus AB students will have 16 multiple choice and short response prompts that model the rigor of questions on the AP Calculus AB Exam.

Applications of Integration for Google Drive™

This set of **16 Digital Task Cards** is designed for students in AP Calculus. Students can interact with the activity on their one-to-one devices in a variety of ways. This 16-question activity is in multiple choice and short answer format with task cards presented on **Google Forms** for a self-grading set.

Students will answer prompts for Applications of Integration that include:

- ✓ Area Between Two Curves
- ✓ Volume of Solids by Known Cross-Sections
- ✓ Volume of Solids by Disk Method
- ✓ Volume of Solids by Washer Method
- ✓ Volume of Solids about a line
- ✓ Writing an Integral for a Solid of Revolution
- ✓ Finding an endpoint, given an area

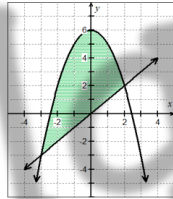
There is also a set of blackline master mini-task cards to create a paper and pencil lesson if you are in need of this feature, along with a student recording sheet if you want to collect student work, and an answer key.

***NOTE: YOU AND YOUR STUDENTS MUST HAVE ACCESS TO THE INTERNET TO BEGIN TO INTERACT WITH THE LESSON!**

Applications of Integration for Google Drive™

1

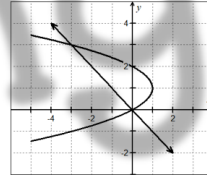
Find the area of the region bounded by the graphs of $y = 6 - x^2$ and $y = x$.



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2

Find the area of the region bounded by the graphs of $x = 2y - y^2$ and $x = -y$.



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3

Find the volume of a solid whose base is bounded by $x^2 + y^2 = 16$ with cross sections perpendicular to the x -axis that are equilateral triangles. Round answer to three decimal places.



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4

The base of a solid is the region enclosed by $y = e^x$, the x -axis, the y -axis, and the line $x = \ln 3$. Write an integral that represents the volume of the solid if cross sections perpendicular to the x -axis are squares.

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5

The base of a solid is a region bounded by the lines $y = x$, $y = -x$ and $x = 4$. Find the volume of the solid if the cross sections perpendicular to the x -axis are equilateral triangles.

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6

The volume of the solid generated by revolving the region bounded by the graphs of $y = \sqrt{x}$ and $y = x$ about the y -axis is

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7

The base of a solid is bounded by $x = y^2$ and $x = 16$. Find the volume if cross sections perpendicular to the x -axis are isosceles right triangles with one congruent side in the xy -plane.

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8

Sketch the region R bounded by the graphs of $y = 2 - x^2$, $y = 1$, $x = 0$. Find the volume of the solid generated by revolving the shape about the y -axis.

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9

Sketch the region R bounded by the graphs of $y = \sqrt{x+2}$, $y = x$, $x = 0$. Find the volume of the solid generated by revolving about the x -axis.

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10

The base of a solid is bounded by $y = x^2$ and $y = 4$. Find the volume of the solid if cross sections perpendicular to the x -axis are squares.

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11

The base of a solid is bounded by $y = x^2$ and $y = 4$. Find the volume of the solid if cross sections perpendicular to the y -axis are semi circles. Round your answer to three decimal places



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12

Find the volume of the solid generated by revolving the region bounded by the graph $y = x^3$, the line $y = 1$, and $x = 0$, about the y -axis.

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13

The area under the curve of $y = \sin x$ from $x = b$ to $x = \pi$ is 0.6. If $0 \leq b < \pi$, then $b =$



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14

Find the volume of the solid formed by rotating the region bounded by the graph of $y = \sqrt{x} + 1$, the y -axis, and the line $y = 3$ about the y -axis.



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15

Write an integral that represents the volume of a solid whose base is the region enclosed by $y = e^x$ and the lines $y = 1$ and $x = \ln 3$, where the cross sections perpendicular to the y -axis are squares.

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16

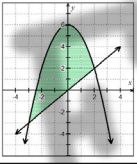
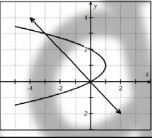
Calculate the volume of the solid generated by rotating the region bounded by the graph of $y = 3 - x^2$ and the x -axis about the line $y = -2$. Round your answer to three decimal places.



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Name: _____ Date: _____ Score: _____ 1. Find the area of the region bounded by the graphs of $y = 6 - x^2$ and $y = x$. 	2. Find the area of the region bounded by the graphs of $x = 2y - y^2$ and $x = -y$. 
3. Find the volume of a solid whose base is bounded by $x^2 + y^2 = 16$ with cross sections perpendicular to the x -axis that are equilateral triangles. Round answer to three decimal places.	4. The base of a solid is the region enclosed by $y = e^x$, the x -axis, the y -axis, and the line $x = \ln 3$. Write an integral that represents the volume of the solid if cross sections perpendicular to the x -axis are squares. [A.] $\pi \int_0^{\ln 3} e^{2x} dx$ [B.] $\int_0^{\ln 3} e^{2x} dx$

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9. Sketch the region R bounded by the graphs of $y = \sqrt{x+2}$, $y = x$, $x = 0$. Find the volume of the solid generated by revolving about the x -axis. [A.] $\frac{10}{3}$ [B.] $\frac{10\pi}{3}$ [C.] $\frac{9\pi}{2}$ [D.] 3π	10. The base of a solid is bounded by $y = x^2$ and $y = 4$. Find the volume of the solid if cross sections perpendicular to the x -axis are squares. [A.] $\frac{64}{3}$ [B.] $\frac{64}{15}$ [C.] $\frac{256}{15}$ [D.] $\frac{512}{15}$
11. The base of a solid is bounded by $y = x^2$ and $y = 4$. Find the volume of the solid if cross sections perpendicular to the y -axis are semi-circles. Round your answer to three decimal places.	12. Find the volume of the solid generated by revolving the region bounded by the graph $y = x^3$, the line $y = 1$, and $x = 0$, about the y -axis. [A.] $\frac{2\pi}{5}$ [B.] $\frac{2\pi}{3}$

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13. The area under the curve of $y = \sin x$ from $x = b$ to $x = \pi$ is 0.6. If $0 \leq b < \pi$, then $b =$ [A.] 1.159 [B.] 1.982 [C.] 0.927 [D.] 2.214	14. Find the volume of the solid formed by rotating the region bounded by the graph of $y = \sqrt{x} + 1$, the y -axis, and the line $y = 3$ about the y -axis. [A.] 145.77 [B.] 100.531 [C.] 20.106 [D.] 8.378
15. Write an integral that represents the volume of the solid whose base is the region enclosed by $y = e^x$ and the lines $y = 1$ and $x = \ln 3$, where the cross sections perpendicular to the y -axis are squares. [A.] $\int_1^3 [\ln 3 - \ln y]^2 dy$ [B.] $\pi \int_1^3 [\ln 3 - \ln y]^2 dy$ [C.] $\int_0^{\ln 3} [\ln 3 - \ln y]^2 dy$ [D.] $\int_1^3 [(\ln 3)^2 - (\ln y)^2] dy$	16. Calculate the volume of the solid generated by rotating the region bounded by the graph of $y = 3 - x^2$ and the x -axis about the line $y = -2$. Round your answer to three decimal places.

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Applications of Integration	Name: _____
1.	2.
3.	4.
5.	6.
7.	8.

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9.	10.
11.	12.
13.	14.
15.	16.

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Your students can record answers on a Google Form for easy grading.

AP Calculus AB APCalculusNMSI Smartphone Marke... SOBC // Module 5 ... New AP Calculus A... Calculus Applets

← Digital Differential Equations ☆

QUESTIONS RESPONSES Total points: 12

3.

A population grows according to the equation $P(t) = 5000 - 3200e^{-0.145t}$ for $t \geq 0$, where t is measured in years. As time goes forward, the population will approach a limiting value. During which year will the population reach half of this limiting value?

[A] second [B] third

[C] fourth [D] seventh

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Question #3 *

☐ A

☐ B

☐ C

☐ D

SEND

16 Multiple Choice and Short Answer Task Cards

