

AP[®] Calculus

Integration

St. Patrick's Day



1 Evaluate the integral. $\int x^2(x^3 + 5)^6 dx$

A. $\frac{1}{7}(x^3 + 5)^7 + C$

B. $\frac{1}{21}(x^3 + 5)^7 + C$

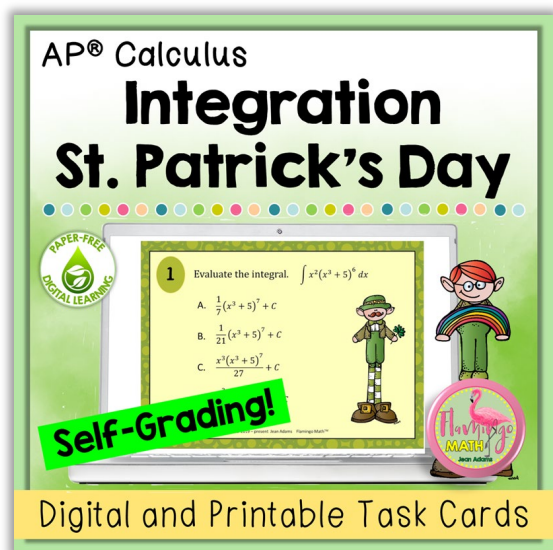
C. $\frac{x^3(x^3 + 5)^7}{27} + C$



Self-Grading!



Digital and Printable Task Cards



AP Calculus Integration Practice for Google™ Drive

Your AP Calculus AB students will have 16 multiple choice prompts that model the rigor of questions on the AP Calculus AB Exam with a St Patrick's Day theme.

St. Patrick's Day Integration Practice

This set of **DIGITAL TASK CARDS** is designed for students in AP CALCULUS AB or BC. 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 format with large task cards presented on **Google Slides** or a self-grading set on **Google Forms**.

Students will answer integration question topics:

- ✓ Indefinite integrals
- ✓ Definite integrals
- ✓ U-Substitution
- ✓ Transcendental functions
- ✓ Inverse Trigonometric integration
- ✓ Find $F(x)$ given $f'(x)$ and a point
- ✓ Write equivalent expressions and changing bases with u-substitution
- ✓ Given f'' and initial conditions, find $F(x)$

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.

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

1

Evaluate the integral. $\int x^2(x^3 + 5)^6 dx$

- A. $\frac{1}{7}(x^3 + 5)^7 + C$
 B. $\frac{1}{21}(x^3 + 5)^7 + C$
 C. $\frac{x^3(x^3 + 5)^7}{27} + C$
 D. $\frac{x^3}{3}\left(\frac{x^4}{4} + 5x\right)^6 + C$



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2

Evaluate the integral. $\int x\sqrt{8 - 4x^2} dx$

- A. $-\frac{1}{12}(8 - 4x^2)^{3/2} + C$
 B. $-\frac{1}{8}(8 - 4x^2)^{3/2} + C$
 C. $-\frac{1}{3}(8 - 4x^2)^{3/2} + C$
 D. $\frac{2}{3}(8 - 4x^2)^{3/2} + C$



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3

Integrate. $\int \frac{x^2}{(16 - x^3)^2} dx$

- A. $\frac{-1}{3(16 - x^3)^3} + C$
 B. $\frac{-3}{3(16 - x^3)^3} + C$
 C. $\frac{1}{3(16 - x^3)^3} + C$
 D. $\frac{1}{3(16 - x^3)^6} + C$



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4

Integrate. $\int \frac{12}{x^2 - 9x^2} dx$

- A. $-\frac{1}{\pi}$
 B. $\frac{1}{25\pi}$
 C. $\frac{2}{3\pi}$
 D. $\frac{1}{3\pi}$



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5

Integrate. $\int \pi \sin(2\pi x) dx$

- A. $-\frac{1}{2}\cos(2\pi x) + C$
 B. $-\frac{1}{2}\cos(2x) + C$
 C. $\frac{1}{2}\sin(2\pi x) + C$
 D. $-2\cos(2\pi x) + C$

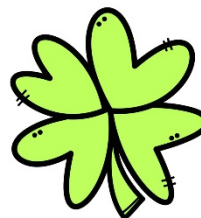


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6

Find an equation for the function whose derivative is $f'(x) = 2\sin(14x)$ and passes through the point $\left(\frac{\pi}{14}, -\frac{6}{7}\right)$

- A. $F(x) = \frac{1}{14}\cos(14x) + 1$
 B. $F(x) = -\frac{1}{28}\cos(7x) + 2$
 C. $F(x) = -\frac{1}{7}\cos(14x) - 1$
 D. $F(x) = \frac{1}{14}\cos(28x) + 14$



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7

Evaluate. $\int_0^{\pi/3} \sin(3x) dx$

- A. -2
 B. $-\frac{2}{3}$
 C. 0
 D. $\frac{2}{3}$



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8

Evaluate $\int_0^2 \sqrt{2x+1} dx$. If $u = 2x + 1$ then an equivalent expression is

- A. $\frac{1}{2} \int_{-1/2}^{1/2} \sqrt{u} du$
 B. $\frac{1}{2} \int_1^5 \sqrt{u} du$
 C. $\frac{1}{2} \int_0^2 \sqrt{u} du$
 D. $\int_1^5 \sqrt{u} du$



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9

Evaluate the definite integral. $\int_1^2 \frac{e^{3\sqrt{x}}}{\sqrt{x}} dx$

- A. $e^{3\sqrt{2}} - e^3$
 B. $\frac{e^{3\sqrt{2}} - e^3}{3}$
 C. $\frac{2(e^{3\sqrt{2}} - e^3)}{3}$
 D. $\frac{e^{3\sqrt{2}} - e^3}{6}$



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10

Evaluate the definite integral. $\int_{\ln 3}^{\ln 7} e^{-x} dx$

- A. $\frac{4}{21}$
 B. $\frac{10}{21}$
 C. 4
 D. 10



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11

Integrate. $\int \frac{1}{9 + (x-4)^2} dx$

- A. $\frac{1}{9} \arctan\left(\frac{x-4}{3}\right) + C$
 B. $9 \arctan\left(\frac{x-4}{3}\right) + C$
 C. $3 \arctan\left(\frac{x-4}{3}\right) + C$
 D. $\frac{1}{3} \arctan\left(\frac{x-4}{3}\right) + C$



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12

Integrate. $\int \cos(3x) \cdot e^{\sin(3x)} dx$

- A. $e^{\sin(3x)} + C$
 B. $\frac{1}{3} e^{\sin(3x)} + C$
 C. $\sin(3x) e^{\sin(3x)} + C$
 D. $\frac{1}{3} e^{-\cos(3x)} + C$

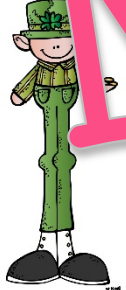


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13

Integrate. $\int_4^5 \frac{x^2-4}{x-2} dx$

- A. $\frac{13}{2}$
 B. $\frac{11}{2}$
 C. $\frac{5}{2}$
 D. 11



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14

Integrate. $\int \frac{x^2+3x-1}{x} dx =$

- A. $\frac{1}{3}x^3 + \frac{3}{2}x^2 - x + \ln 2$
 B. $5 - \ln 2$
 C. $11 + \ln 2$
 D. $\frac{9}{2} + \ln 2$



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15

Find $y = f(x)$ if $f''(x) = x + 2$, $f'(0) = 3$, and $f(0) = -1$

- A. $y = x^3 + 6x^2 + 18x - 6$
 B. $y = \frac{1}{6}x^3 + x^2 + 3x - 1$
 C. $y = \frac{1}{6}x^3 + 2x^2 + 1$
 D. $y = \frac{1}{6}x^3 + x^2 + \frac{21}{2}x + \frac{61}{6}$



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16

Integrate. $\int \frac{1}{\sqrt{4x-x^2}} dx$

- A. $\frac{1}{2} [\ln x + \ln(1-x)] + C$
 B. $\frac{1}{2} \sin^{-1}(x-2) + C$
 C. $\sin^{-1}\left(\frac{x-2}{2}\right) + C$
 D. $\frac{1}{2} \ln(4x-x^2) + C$



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Students can answer prompts directly on the Slides in Google Drive by moving a large check-mark next to their answer choice.

St. Patrick's Day Integration Task

1 Evaluate the integral. $\int x^2(x^3 + 5)^6 dx$

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☒ B. $\frac{1}{21}(x^3 + 5)^7 + C$

C. $\frac{x^3(x^3 + 5)^7}{27} + C$

D. $\frac{x^3}{3}\left(\frac{x^4}{4} + 5x\right)^6 + C$

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

St. Patrick's Day Integration

QUESTIONS RESPONSES Total points: 16

Card #1 *

☐ A

☐ B

☐ C

☐ D

Card #1

1 Evaluate the integral. $\int x^2(x^3 + 5)^6 dx$

A. $\frac{1}{7}(x^3 + 5)^7 + C$

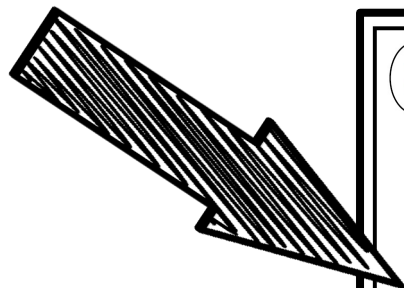
B. $\frac{1}{21}(x^3 + 5)^7 + C$

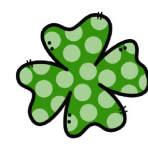
C. $\frac{x^3(x^3 + 5)^7}{27} + C$

D. $\frac{x^3}{3}\left(\frac{x^4}{4} + 5x\right)^6 + C$



Blackline Masters, too!



1 Evaluate the integral. $\int x^2(x^3 + 5)^6 dx$ A. $\frac{1}{7}(x^3 + 5)^7 + C$ B. $\frac{1}{21}(x^3 + 5)^7 + C$ C. $\frac{x^3(x^3 + 5)^7}{27} + C$ D. $\frac{x^3}{3}\left(\frac{x^4}{4} + 5x\right)^6 + C$ © 2019 – present Jean Adams Flamingo Math™ 	2 Evaluate the integral. $\int x\sqrt{8 - 4x^2} dx$ A. $-\frac{1}{12}(8 - 4x^2)^{3/2} + C$ B. $-\frac{1}{8}(8 - 4x^2)^{3/2} + C$ C. $-\frac{1}{3}(8 - 4x^2)^{3/2} + C$ D. $\frac{2}{3}(8 - 4x^2)^{3/2} + C$ © 2019 – present Jean Adams Flamingo Math™ 
3 Integrate. $\int \frac{x^2}{(16 - x^3)^2} dx$ A. $\frac{-1}{3(16 - x^3)^3} + C$ B. $\frac{1}{3}(16 - x^3)^2 + C$ C. $\frac{-1}{3(16 - x^3)} + C$ D. $\frac{1}{3(16 - x^6)} + C$ © 2019 – present Jean Adams Flamingo Math™ 	4 Integrate. $\int_0^{1/6} \frac{12}{\sqrt{1 - 9x^2}} dx$ A. $\frac{12}{25\pi}$ B. $\frac{12}{25}\pi$ C. $\frac{2}{3}\pi$ D. $\frac{1}{3\pi}$ © 2019 – present Jean Adams Flamingo Math™ 

Student Recording Sheet

St Patrick's Day Integration			
Name _____			
1.	2.	3.	4.
5.	6.	7.	8.
9.	10.	11.	12.
13.	14.	15.	16.

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