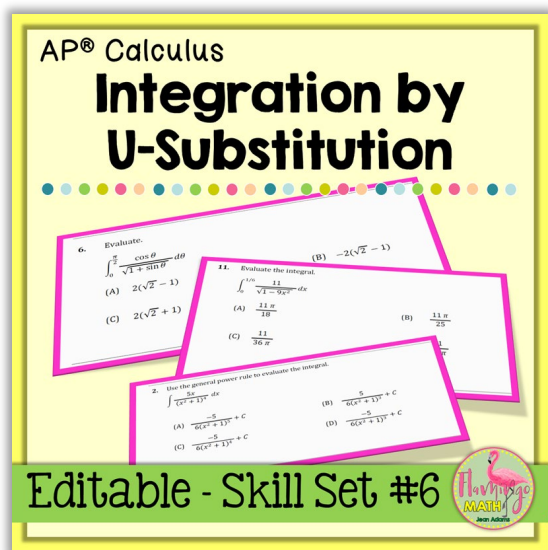


Integration by U-Substitution Skill Set #6



KEY CONCEPTS/TOPICS:

Topic 6.7: The Fundamental Theorem of Calculus and Definite Integrals

Topic 6.8: Finding Antiderivatives and Indefinite Integrals

Topic 6.9: Integration Using Substitution

Product Overview

Your Calculus students will practice AP-Style multiple choice questions related to Integration using U-Substitution with this 16-question skill set. The fully-editable resource is designed as a series of “Multiple Choice Monday” Exam Prep and Practice. All questions in the set are non-calculator prompts and should be able to be completed in a 30 to 35-minute period.

Multiple Choice Monday

Multiple Choice Monday Integration by U-Substitution

Name _____

1. Use the general power rule to evaluate the integral.

$$\int x\sqrt{4-9x^2} \, dx$$

- (A) $-\frac{1}{27}(4-9x^2)^{\frac{3}{2}} + C$ (B) $-\frac{1}{18}(4-9x^2)^{\frac{3}{2}} + C$
(C) $\frac{2}{3}(4-9x^2)^{\frac{3}{2}} + C$ (D) $-\frac{4}{27}(4-9x^2)^{\frac{3}{2}} + C$

2. Use the general power rule to evaluate the integral.

$$\int \frac{5x}{(x^2+1)^4} \, dx$$

3. Use the general power rule to evaluate the integral.

$$\int \frac{6(x^2+1)^{-1/2}}{(x^2+1)^4} \, dx$$

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

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4. Find the equation $F(x)$, for the function whose derivative is $f'(x) = \cos(14x)$ and passes through the point $(\frac{\pi}{14}, -\frac{6}{7})$.

- (A) $F(x) = \frac{1}{7}\cos(14x) - 1^4$ (B) $F(x) = -\frac{1}{7}\cos(14x)$
(C) $F(x) = \frac{1}{14}\cos(14x)$ (D) $F(x) = \frac{1}{14}\cos(14x) - \frac{6}{7}$

5. Using the substitution $u = 2x + 1$ find an antiderivative of $\frac{2}{\sqrt{2x+1}}$.

$$\int_0^2 \sqrt{u} \, du$$

$$(B) \frac{1}{2} \int_1^4$$

$$\int_0^2 \sqrt{u} \, du$$

$$(D) \int_1^5 \sqrt{u} \, du$$

6. Evaluate the definite integral.

$$(A) 2(\sqrt{2} - 1)$$

$$(B) -2(\sqrt{2} - 1)$$

$$(C) 2(\sqrt{2} + 1)$$

$$(D) 2(\sqrt{2})$$

7. Find the indefinite integral.

$$\int 4xe^{5x^2} \, dx$$

$$(A) 20xe^{5x^2} + C$$

$$(B) \frac{4}{5}e^{5x^2} + C$$

$$(C) \frac{2}{5}e^{5x^2} + C$$

$$(D) \frac{4}{5}e^{5x^2} + C$$

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Students gain valuable practice for AP Calculus Exam concepts

8. Find the indefinite integral.

$$\int \frac{1}{9 + (x-7)^2} dx$$

- (A) $\frac{1}{9} \arctan\left(\frac{x-7}{3}\right) + C$ (B) $3 \arctan\left(\frac{x-7}{3}\right) + C$
 (C) $\frac{1}{3} \arctan\left(\frac{x-7}{3}\right) + C$ (D) $\frac{1}{9} \arctan\left(\frac{x-7}{9}\right) + C$

9. Evaluate the definite integral.

$$\int_1^2 \frac{e^{3\sqrt{x}}}{\sqrt{x}} dx$$

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

11. Evaluate the integral.

$$\int_0^{1/6} \frac{11}{\sqrt{1-9x^2}} dx$$

- (A) $\frac{11\pi}{18}$ (B) $\frac{11\pi}{25}$

$$\frac{11\pi}{18}$$

12. Evaluate the integral.

$$\int_0^{\pi/2} 3x e^{\sin(x)} dx$$

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

13. Evaluate the indefinite integral.

$$\int \frac{x^2}{8x^3 + 9} dx$$

- (A) $\ln|8x^3 + 9| + C$ (B) $24 \ln|8x^3 + 9| + C$
 (C) $\frac{1}{24} \ln|8x^3 + 9| + C$ (D) $\frac{1}{8} \ln|8x^3 + 9| + C$



14. Evaluate.

$$\int_0^{\pi/2} (\sin^3 x)(\cos x) dx$$

(A) $-\frac{1}{4}$

(B) $\frac{1}{4}$

(C) -9

(D) -27

15. Find the indefinite integral.

$$\int 4^{3x} dx$$

(A) $\frac{4^{3x}}{4} + C$

(B) $\frac{4^{3x}(\ln 4)}{3}$

(C) $3(\ln 4)(4^{3x}) + C$

(D) $\frac{4^{3x}}{3 \ln 4} + C$

Name _____ Date _____ Period _____

AP CALCULUS

Multiple Choice

Monday

I. Multiple Choice

1.	(A)	(B)	(C)	(D)
2.	(A)	(B)	(C)	(D)
3.	(A)	(B)	(C)	(D)
4.	(A)	(B)	(C)	(D)
5.	(A)	(B)	(C)	(D)
6.	(A)	(B)	(C)	(D)
7.	(A)	(B)	(C)	(D)
8.	(A)	(B)	(C)	(D)
9.	(A)	(B)	(C)	(D)
10.	(A)	(B)	(C)	(D)
11.	(A)	(B)	(C)	(D)
12.	(A)	(B)	(C)	(D)
13.	(A)	(B)	(C)	(D)
14.	(A)	(B)	(C)	(D)
15.	(A)	(B)	(C)	(D)
16.	(A)	(B)	(C)	(D)



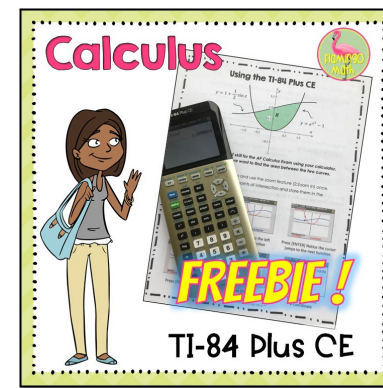
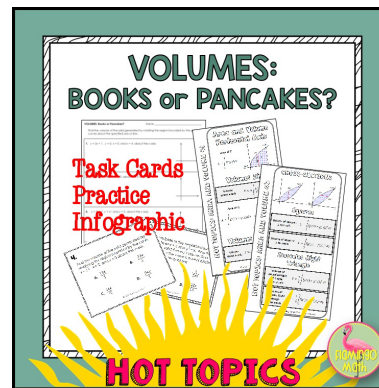
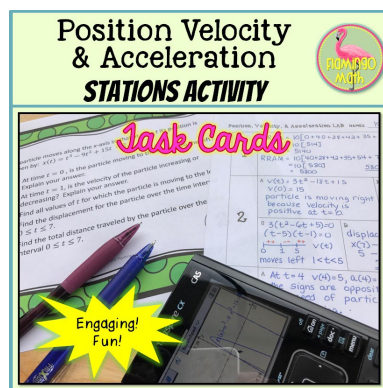
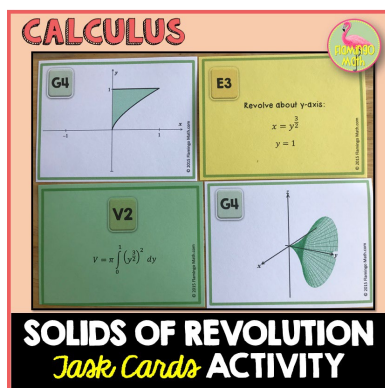
Use as a timed-practice test prep prior to the AP Exam



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