

- Which of these is a definition of a^x for all positive numbers a and all real numbers x ?
(2017-01-11, 1.1, practice)
 - A. $\ln(x \cdot e^a)$
 - B. a multiplied by itself x times
 - C. the unique function for which $\frac{d}{dx}[a^x] = a^x$
 - D. $\exp(x \ln a)$
- Which of these statements is false? (2017-01-11, 1.1, practice)
 - A. $\ln(abc) = \ln(a) + \ln(b) + \ln(c)$
 - B. $\frac{d}{dx}[\ln x] = \frac{1}{|x|}$ for all nonzero numbers x
 - C. $y = \exp(x)$ if and only if $x = \ln(y)$
 - D. $e^x = \exp(x)$

1. The Substitution Rule is the opposite of which derivative rule? (2017-01-19, 2.1)

- A. Chain Rule
- B. Product Rule
- C. Quotient Rule
- D. Power Rule

2. What is incorrect about the following attempt at using the Substitution Rule?

$$\int_0^1 (3 - 2x)^5 dx = \int_0^1 u^5 \left(-\frac{1}{2} du \right)$$

(2017-01-19, 2.1)

- A. dx should have been replaced with $+\frac{1}{2} du$.
- B. u shouldn't be raised to the 5th power.
- C. dx should have been replaced with $-2 du$.
- D. The bounds are incorrect.

3. Which of these formulas would be most useful in finding $\int \sin^4 \theta \cos^2 \theta \, d\theta$? (2017-01-25, 2.2)

A. $\sin^2(\theta) = \frac{1}{2} + \frac{1}{2} \sin(2\theta)$

B. $\cos^2(\theta) = \frac{1}{2} + \frac{1}{2} \cos(2\theta)$

C. $\cos^2(\theta) = 1 - \sin^2(\theta)$

D. $\sin^2(\theta) = 1 - \cos^2(\theta)$

4. Which of these formulas would be most useful in finding $\int \sec^4(\theta) \, d\theta$? (2017-01-25, 2.2)

A. $\sec^2(\theta) = 1 + \tan^2(\theta)$

B. $\sec^2(\theta) = 1 - \tan^2(\theta)$

C. $\tan^2(\theta) = 1 + \sec^2(\theta)$

D. $\tan^2(\theta) = 1 - \sec^2(\theta)$

5. Which of these substitutions would be most useful in finding $\int \frac{1}{25x^2+9} dx$? (2017-01-27, 2.3)
- A. Let $25x^2 + 9 = 25 \sec^2 \theta + 25$.
 - B. Let $25x^2 + 9 = 9 \sin^2 \theta + 9$.
 - C. Let $25x^2 + 9 = 9 \tan^2 \theta + 9$.
 - D. Let $25x^2 + 9 = 25 \cos^2 \theta + 25$.
6. Which of these substitutions would be most useful in finding $\int \frac{1}{x\sqrt{4-16x^2}} dx$? (2017-01-27, 2.3)
- A. Let $4 - 16x^2 = 16 - 16 \cos^2 \theta$.
 - B. Let $4 - 16x^2 = 4 - 4 \sin^2 \theta$.
 - C. Let $4 - 16x^2 = 4 + 4 \tan^2 \theta$.
 - D. Let $4 - 16x^2 = 16 + 16 \sec^2 \theta$.
7. Which of these substitutions would be most useful in finding $\int_3^5 \frac{1}{\sqrt{x^2-9}} dx$? (2017-01-27, 2.3)
- A. Let $x^2 - 9 = 9 \sin^2 \theta + 9$.
 - B. Let $x^2 - 9 = \tan^2 \theta - 1$.
 - C. Let $x^2 - 9 = \cos^2 \theta + 1$.
 - D. Let $x^2 - 9 = 9 \sec^2 \theta - 9$.