MA 126 — Spring 2017 — Prof. Clontz — Readiness Quizzes

- 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 $x^2 - 9 = 9\sec^2\theta - 9$.

8. Which of these sums is the first step in expanding $\frac{4x^2+16x+17}{(x+2)^2(x^2+1)^2}$ into partial fractions? (2017-02-01, 2.4)

   A. $\frac{A}{x+2} + \frac{Bx}{x+2} + \frac{C}{(x^2+1)^2}$

   B. $\frac{A}{x+2} + \frac{Bx}{(x+2)^2} + \frac{Cx+D}{(x^2+1)^2}$

   C. $\frac{A}{x+2} + \frac{B}{(x+2)^2} + \frac{Cx+D}{x^2+1} + \frac{Ex+F}{(x^2+1)^2}$

   D. $\frac{Ax+B}{(x+2)^2} + \frac{Cx+D}{(x^2+1)^2}$

9. Why must $\frac{3+5x^5}{(x+1)(x+3)^2}$ first be simplifed using long polynomial division before using the method of partial fractions? (2017-02-01, 2.4)

   A. It is a rational function of x.

   B. The degree of its numerator is odd, while the degree of its demoninator is even.

   C. The degree of its numerator is greater than or equal to the degree of its denominator.

   D. It is an irrational function of x.