

AB Calculus Practice 4.5

U-substitution, part 1

1. When doing U-substitution, look for a part of the integrand which is the _____ of another part of the integrand.
2. When doing U-substitution, you'll often have to multiply the result by a _____ to make the result "fit."
3. When an integral has u as its variable, the upper and lower _____ need to be _____ values, not x -values or t -values.
4. To convert _____ bounds into u bounds, simply plug each of the x bounds into the expression for _____.
5. When evaluating a definite integral, you don't have to back-_____. You can simply use the _____ bounds with your integrated expression for u .

no calculator needed!

6. What is the antiderivative of $4\csc^2x + 5$?

7. $\int (7e^{3x} - \frac{1}{x}) dx =$

$$8. \int_0^{\frac{\pi}{3}} \sin x \, dx =$$

$$9. \int x^2(x^3 + 5)^4 \, dx =$$

$$10. \int \sin(5x) \, dx =$$

$$11. \int x^4 \sin(x^5) \, dx =$$

12. $\frac{1}{3} \int e^{\frac{t}{3}} dt =$

13. $\int \frac{-e^{\sqrt{x}}}{\sqrt{x}} dx =$

14. Let g be a continuous function. Using the substitution $u = 3x + 1$, the integral $\int_2^3 g(3x - 1) dx$ is equal to which of the following?

(A) $\int_2^3 g(u) du$

(B) $\frac{1}{3} \int_2^3 g(u) du$

(C) $\int_7^{10} g(u) du$

(D) $\frac{1}{3} \int_7^{10} g(u) du$

15. Using the substitution $u = 2x - 3$, $\int_4^5 \sqrt{2x - 3} dx$ is equivalent to

(A) $\int_4^5 \sqrt{u} du$

(B) $\int_5^7 \sqrt{u} du$

(C) $\frac{1}{2} \int_{-1/2}^{1/2} \sqrt{u} du$

(D) $\frac{1}{2} \int_4^5 \sqrt{u} du$

(E) $\frac{1}{2} \int_5^7 \sqrt{u} du$