

Discussion 11/28: Change of Variables (u -sub)

November 28, 2018

Question 1: Some Indefinite Integrals

Compute these indefinite integrals.

$$\int \sin(x) + \cos(x) dx$$

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

$$\int x + \sqrt{x} + \frac{1}{x} dx$$

$$\int 4^x + 5^x + 6^x dx$$

Question 2

Compute

$$\int_1^e \frac{(\ln(x))^5}{x} dx$$

Question 3

Compute

$$\int \frac{e^x}{\sqrt{1-e^{2x}}} dx$$

Hint: Notice that $e^{2x} = (e^x)^2$.

Question 4

Compute

$$\int \tan(x) dx$$

Hint: Use the fact that $\tan(x) = \frac{\sin(x)}{\cos(x)}$.

Question 5

Compute

$$\int \sin(x) - \sin(x)\cos^3(x) dx$$

Hint: Factor out $\sin(x)$.

Question 6

Find

$$\int \frac{1}{x \ln(x) \ln(\ln(x))} dx$$

Hint: Use two substitutions. First do $u = \ln(x)$. Then, once your integral is in terms of u , use another substitution, $v = \ln(u)$.

Question 7

Find

$$\int \frac{1}{x^{1/2} + x^{3/2}} dx$$

Hint: Let $u = \sqrt{x}$. Remember that \sqrt{x} is the same thing as $x^{1/2}$.