

Due 7 July, 2016
MATH 1004, Section A
Total marks: 80

ASSIGNMENT 2

Solve each of the following integrals by substitution. Some might require pre-conditioning: Can you apply a trig substitution? Can you break up the integral into 2 fractions because you've got 2 terms over a common denominator? Each question is worth 5 marks (1 for the correct choice of u , 1 for correctly deriving the needed du expression, 1 for subbing u and du correctly, 1 for using the right antiderivative formula, 1 for your answer).

1.

$$\int (3x + 1)^{33} dx$$

2.

$$\int 4(3 - x)^{20} dx$$

3.

$$\int \frac{2}{(2 + x)^3} dx$$

4.

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

5.

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

6.

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

7.

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

8.

$$\int \frac{x}{\sqrt{1 - x^4}} dx$$

9.

$$\int \frac{\cos x}{1 + \sin^2 x} dx$$

10.

$$\int \frac{\cos^3 x}{1 - \sin^2 x} dx$$

11.

$$\int \frac{\sec^2 x}{\sqrt[3]{\tan x}} dx$$

12.

$$\int \frac{\sec x \tan x}{(1 + \tan^2 x)^3} dx$$

13.

$$\int \frac{\sec^2 x}{1 + \tan x} dx$$

14.

$$\int \frac{1}{x(\ln x)^3} dx$$

15.

$$\int \frac{1}{x(\ln(x^3))^3} dx$$

16.

$$\int \frac{-\tan x}{\ln(\cos x)} dx$$

17.

$$\int \frac{2^x}{\ln(2^x)} dx$$

18.

$$\int x^4 e^{x^5} dx$$

19.

$$\int \cos x e^{\sin x} dx$$

20.

$$\int \frac{\csc^2 x}{e^{\cot x}} dx$$