

MATH 105 – Review Problems: Integrals and Series

Some of these problems will be solved at the **Problem Solving Session**, and the idea of the solutions to all of them will appear some time soon. The meeting is on Tuesday, August 1st, at 11.30am, in LSK 200

Integrals

(a)

$$\int \sin^3(u) \cos^2(u) du$$

(b)

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

(c)

$$\int y^2 \sqrt{1 + y^3} dy$$

(d)

$$\int_1^\infty \frac{\ln(x)}{x^{101}} dx$$

(e)

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

(f)

$$\int \frac{1}{x^2 \sqrt{16 - x^2}} dx$$

(g)

$$\int \cos(\sqrt{x}) dx$$

(h)

$$\int \frac{\cos(t)}{\sqrt{\sin^2(t) + 1}} dx$$

Series

1.

$$\sum_{n=1}^{\infty} \frac{2 \ln n}{n^6}$$

2.

$$\sum_{n=1}^{\infty} (-1)^n \frac{n^3 + 1}{n^3 - 7}$$

3.

$$\sum_{n=1}^{\infty} \frac{7}{n5^n}$$

4.

$$\sum_{n=1}^{\infty} \frac{2n^2}{9n^2 - 7}$$

5.

$$\sum_{n=1}^{\infty} \frac{1}{4 + \sqrt[4]{n^3}}$$

6.

$$\sum_{n=1}^{\infty} (-1)^n \frac{n^3 2^n}{n!}$$

7.

$$\sum_{n=1}^{\infty} \frac{10 + 9^n}{5 + 8^n}$$

8.

$$\sum_{n=1}^{\infty} (-1)^n \frac{\cos n}{n^5}$$