

MATHEMATICS
Monday November 30 2015
First Exercise Class

1) Calculate the following indefinite and definite Integrals

$$\int_0^1 (5x^2 - 1)^3 x \, dx$$

$$\int \frac{1}{\sqrt[3]{(x-1)^2}} \, dx$$

$$\int \sqrt{5x^4 - 3x^2 + 2} (20x^3 - 6x) \, dx$$

$$\int \frac{15x^2 - 2}{5x^3 - 2x + 3} \, dx$$

$$\int_1^{\sqrt[3]{3}} x^2 e^{(x^3-3)} \, dx$$

$$\int \frac{1 + \sin x}{x - \cos x} \, dx$$

$$\int \frac{2x^2 - 5x + 3}{x} \, dx$$

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

$$\int_0^{\log 2} \frac{e^{x+2}}{e^x + 1} \, dx$$

$$\int_1^2 \frac{1+x^2}{x} \, dx$$

2) Calculate the following Integrals through integration by parts

$$\int x \cdot \cos x \, dx$$

$$\int x^2 \sin x \, dx$$

$$\int \log x \, dx$$

$$\int \cos^2 x \, dx$$

$$\int \sqrt[3]{x} \log x \, dx$$

$$\int \frac{x}{\cos^2 x} \, dx$$

$$\int \arcsin x \, dx$$

$$\int_2^{e+1} (3x^2 - 1) \cdot \log(x - 1) \, dx$$

$$\int \log^2 x \, dx$$

3) Calculate the following Integrals by substitution

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

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

$$\int_0^1 \frac{e^{2x}}{1 + e^x} \, dx$$

$$\int \sin^3 x \cos x \, dx$$

$$\int_1^3 \frac{1}{\sqrt{x} + 3} \, dx$$

$$\int x^3 \sqrt{1 - x^2} \, dx$$

$$\int_0^2 \frac{x^3}{1 + x^2} \, dx$$

$$\int \frac{\cos \log x^2}{x} \, dx$$

4) Calculate the following Integrals

$$\int_0^{\pi/2} \sqrt{1 + \cos x} \, dx$$

$$\int_0^4 e^{\sqrt{x}} \, dx$$

$$\int_0^{2\pi} |\sin x| dx$$

$$\int_0^{\pi/3} \frac{\tan x}{1 + \log \cos x} dx$$

$$\int (1 + e^x)^2 dx$$

$$\int e^{x+e^x} dx$$

4) Calculate the following Integrals by Partial Fraction method

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

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

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

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

$$\int_0^1 \frac{1}{1 + 3e^{2x}} dx$$