

MATHEMATICS II
Tuesday March 28
Eighth Exercise Class

1

Calculate the following definite and indefinite Integrals.

$$(1) \quad \int_{-1}^1 (2x^2 - 1)^3 dx$$

$$(2) \quad \int_0^1 \frac{x}{\sqrt[5]{(x+1)^3}} dx$$

$$(3) \quad \int (15x^4 - 8x) \sqrt[3]{3x^5 - 4x^2 + 7} dx$$

$$(4) \quad \int \frac{6x + 4}{(2x^3 + 4x)^2} dx$$

$$(5) \quad \int x^2 10^{x^3} dx$$

2

Calculate the following Integrals through integration by parts.

$$(6) \quad \int x \log^2(5x) dx$$

$$(7) \quad \int (x+1)^2 \cos(x) dx$$

$$(8) \quad \int \cos(x) \log(\sin(x)) dx$$

$$(9) \quad \int_0^1 \frac{x^3}{\sqrt{4+x^2}} dx$$

$$(10) \quad \int_1^2 x^4 \ln^2(x) dx$$

$$(11) \quad \int \cos(\sqrt{x}) dx$$

$$(12) \quad \int_0^\pi e^{\cos(x)} \sin(x) dx$$

3

Calculate the following Integrals by substitution.

$$(13) \quad \int x^3 \sqrt{9-x^2} dx$$

$$(14) \quad \int \frac{x^3}{\sqrt{x^2+4}} dx$$

$$(15) \quad \int \frac{\sqrt{x^2-1}}{x} dx$$

$$(16) \quad \int \sqrt{e^x-1} dx$$

$$(17) \quad \int_1^2 \frac{\ln(x)}{\sqrt{x}} dx$$

4

Evaluate the following Integrals.

$$(18) \quad \int \tan^2(x) dx$$

$$(19) \quad \int \frac{\sin(\sqrt[3]{x})}{\sqrt[3]{x}} dx$$

$$(20) \quad \int_0^{\pi/2} \sin(2x) dx$$

$$(21) \quad \int \sin^2(\pi x) \cos^5(\pi x) dx$$

$$(22) \quad \int \frac{3 \sin(x)}{9 \cos^2(x) - 18 \cos(x) + 10} dx$$

$$(23) \quad \int \sqrt{\frac{1-x}{1+x}} dx$$

5

Calculate the following Integrals by Partial Fraction method.

$$(24) \quad \int_2^3 \frac{1}{x^2 - 1} dx$$

$$(25) \quad \int_0^1 \frac{x-1}{x^2 + 3x + 2} dx$$

$$(26) \quad \int \frac{x+4}{x^2 + 2x + 5} dx$$

$$(27) \quad \int_3^4 \frac{x^3 - 2x - 4}{x^3 - 2x} dx$$

$$(28) \quad \int \frac{e^x}{(e^x - 2)(e^{2x} + 1)} dx$$

$$(29) \quad \int \frac{1}{x\sqrt{x+1}} dx$$