

MATH 215 WORKSHEET #13

(1) Compute the following definite integrals.

(a) $\int_7^7 \frac{1}{t^3 + 3} dt$

(b) $\int_0^1 6x(3x^2 + 1)^3 dx$

(c) $\int_1^2 \frac{1}{y + 1} dy$

(d) $\int_0^{\frac{\pi}{4}} \sin 4x dx$

(e) $\int_0^4 x^2 e^{x^3-1} dx$

(f) $\int_{-1}^1 x e^x dx$

(g) $\int_0^1 x e^{2x} dx$

(2) Compute the following indefinite integrals.

(a) $\int y^3(2y + \frac{1}{y}) dy$

(b) $\int \frac{2t}{t^2 - 4} dt$

(c) $\int 2x e^{x^2} dx$

(d) $\int (2x + 1)^6 dx$

(e) $\int x \ln x dx$

(f) $\int x \sin x^2 dx$

(g) $\int x^3 \sin x^2 dx$

(3) Estimate $\sum_{k=1}^{400} \frac{1}{k} = 1 + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{400}$.

(4) Estimate $\int_0^1 \sin x^2 dx$.

(5) Estimate $\int_0^1 e^{-x^2} dx$.