

Math 106 Midterm 1

Question 1(2+3+3)

- a) Find the number c so that $\sum_{k=1}^{30} (k^2 - c) = 0$
- b) Approximate the integral $\int_0^{2\pi} (\cos x)^4 dx$ using Simpson's rule with $n=8$
- c) Use Riemann sums to evaluate $\int_0^1 x^3 dx$

Question 2(3+2+3)

- a) Evaluate the integral $\int \frac{5^{\tan x}}{(\cos x)^2} dx$
- b) If $y = 2(\sin x)^2 + x^\pi \pi^x$ find y'
- c) Compute $\int \frac{dx}{\sqrt{x}(2+x)}$

Question 3(3+3+3)

- a) Find $\int \frac{(\ln x + 1) dx}{\sqrt{16(x \ln x)^2 - 9}}$
- b) Evaluate the integral $\int \frac{dx}{x\sqrt{x^5 - 4}}$
- c) Compute $\int \frac{2e^{-3x} dx}{1 - e^{-6x}}$