

Math 1315, First Exam February 14, 2005

(relax...) Please show all your work. In particular, if integrals are improper, please rewrite them as limits of proper integrals and then solve.

1. Find $\int_0^z 3x^2 e^{i x^3} dx$

2. Find $\int \frac{1}{z^5 - i} dz$

3. Find $\int \frac{1}{25 - i q^2} dq$

4. Calculate $\int_0^{\pi/2} x \cos(x) dx$

5. Calculate $\int_{r=2}^{r=4} \frac{r^2 - 3}{r} dr$

6. Calculate $\int_1^{\sqrt{1}} \frac{1}{x^5} dx$

7. Use the midpoint rule with four boxes to estimate $\int_0^{0.8} e^{i x^2} dx$

8. Find the Taylor polynomial of degree 5 ($n = 5$) centered at zero ($a = 0$) for the function $f(x) = \sin(x)$