King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 102 (162) Sec 30 - Quiz 4

Name: ID: Serial No.:

1. Find $\int \frac{x^3 + x^2}{x^2 - 5x + 6} dx$.

2. Find $\int \sec^6(x)\tan^3(x)dx$

3. Find $\int \frac{1}{1-5\sin x}dx$

   Hint: Use the substitution $t = \tan\left(\frac{x}{2}\right), \quad -\pi < x < \pi.$

4. Find $\int \frac{x^2}{(9+x^2)^{5/2}} dx$

5. Determine whether the integral $\int_0^{\pi^2/4} \frac{1+\sin\sqrt{x}}{\sqrt{x}}dx$ is convergent or divergent? Find the value of the integral if it is convergent.

6. Make a substitution to express the integral $\int \frac{1}{\sqrt{x} - \sqrt[3]{x}} dx$ as a rational fraction and then evaluate the integral.

   Hint: Use the substitution $u = \sqrt[6]{x}$