

Name _____

- You have 20 minutes
- No calculators
- Show sufficient work

1. (2 points each) Evaluate the following indefinite integrals.

(a) $\int (3x - 10\sqrt{x})^2 dx$

(b) $\int \frac{x^2 + 10}{x^2 + 1} dx$

2. (2 points) Evaluate the following definite integral. Simplify your answer.

$$\int_{\pi/6}^{\pi/3} \frac{\cos^3 x \sin^2 x + \cos^5 x}{1 - \sin^2 x} dx$$

3. (2 points) Suppose $p(x) = \int_8^{x^3-75x} \frac{1}{t^4 + 100} dt$. Determine each interval upon which the graph of $p(x)$ is decreasing.

4. (2 points) An oil storage tank ruptures and oil leaks from the tank at the rate of $r(t) = 3\sqrt{t}$ liters per minute where t is measured in minutes since the tank was ruptured. How much oil leaks out of the tank during the first 25 minutes?