

Name _____

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

1. (2 points) A town currently has a population of 4000 people. Suppose the town's population grows by $0.75t^2$ people per year where t is measured in years from now. What will the town's population be in 10 years?

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

$$\int_1^4 \frac{4\sqrt{x} - 5x}{x} dx$$

3. (2 points each) Evaluate the following indefinite integrals.

(a) $\int \frac{10x^3 + 10x + 3}{x^2 + 1} dx$

(b) $\int \frac{\cos(2x)}{\cos(x) - \sin(x)} dx$

4. (2 points) Suppose $g(x) = \int_{x^3}^4 \frac{1}{t^6 + 1} dt$. Find $g'(x)$.