

Name _____

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

1. (2 points) Suppose $w(x) = \int_{x^2}^5 \tan^6 t \, dt$. Find $w'(x)$.

2. (2 points) Evaluate the following indefinite integral.

$$\int \frac{(x^2 + 3)^2}{x^3} \, dx$$

3. (2 points) Evaluate the following indefinite integral.

$$\int \frac{\cot^2(\theta) + 1}{\cot^2(\theta)} \, d\theta$$

4. (2 points) Evaluate the following definite integral. Simplify your answer.

$$\int_1^4 \frac{18\sqrt{x} - x^3}{3x} dx$$

5. (2 points) The height of a tree is currently 10 ft. Suppose the tree's height is increasing by $6\sqrt{t}$ in/month where t is measured in months from now. What will the tree's height be in 4 months? (Note: 1 ft = 12 in)