

Name \_\_\_\_\_

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

1. (2 points) Precisely state *The Mean Value Theorem*.

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

$$\int_0^{\sqrt{3}} 18t\sqrt{t^2+1} dt$$

3. (2 points) Evaluate the indefinite integral.

$$\int \frac{60e^{3x}}{(e^{3x} + 2)^{11}} dx$$

4. (2 points) Evaluate the indefinite integral.

$$\int 4 \sin^7(x) \cos(x) (\sin^4(x) + 5)^{100} dx$$

5. (2 points) Let  $\mathbf{R}$  be the finite region bounded by the given functions. In the following way, set up but do not evaluate definite integrals which represent the area of the region  $\mathbf{R}$ .

$$y = 3e^{2x}$$

$$y = -4x + 3$$

$$y = 27$$

(a) Integrate with respect to  $x$ .

(b) Integrate with respect to  $y$ . (The integrands in parts (a) and (b) should be different.)