

Present neatly on separate paper. Justify for full credit. No Calculators.

Name \_\_\_\_\_ Score \_\_\_\_\_ A (15 minutes) **x 3**

1) Integrate. (10 points)

a)

$$\int_{-5}^0 x\sqrt{4-x} dx$$

b)

$$\int_0^{2/\sqrt{3}} \frac{1}{4+9x^2} dx$$

2) [Short Essay] (5 points)

State the two parts of the Fundamental Theorem of Calculus, and explain what is meant by the statement "Differentiation and integration are inverse processes."

3) (5 points)

A 10-gram tumor is discovered in a laboratory rat on March 1. The tumor is growing at a rate of  $r(t) = t / 7$  grams per week, where  $t$  denotes the number of weeks since March 1. What will the mass of the tumor be on June 7?

Present neatly on separate paper. Justify for full credit. No Calculators.

Name \_\_\_\_\_ Score \_\_\_\_\_ F (15 minutes) **x 3**

1) Integrate. (10 points)

a)

$$\int_0^1 \frac{dx}{\sqrt{3x+1}}$$

b)

$$\int_e^{e^2} \frac{dx}{x \ln x}$$

2) (5 points)

Find a function  $f$  and a number  $a$  such that

$$2 + \int_a^x f(t) dt = e^{3x}$$

3) (5 points)

A 10-gram tumor is discovered in a laboratory rat on March 1. The tumor is growing at a rate of  $r(t) = t / 7$  grams per week, where  $t$  denotes the number of weeks since March 1. What will the mass of the tumor be on June 7?