

Name \_\_\_\_\_

**No calculators allowed!**

1. (1 points) If  $w = 100e^{-0.3t}$ , then

$\frac{dw}{dt} =$
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2. (1 points) If  $y$  is a function of  $t$  for which  $\frac{dy}{dt} = 60e^{3t}$ , then find one possible formula for  $y$  in terms of  $t$ .

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

$$\int \frac{1}{t^2} dt$$

4. (6 points) Find explicit solutions to the following initial value problems.

(a)  $\frac{dq}{dt} = -0.4q, \quad q(0) = 30$

(b)  $\frac{dw}{dz} = 0.6z, \quad w(0) = 40$

(c)  $\frac{dy}{dx} = \frac{2x - 5}{3y^2}, \quad y(0) = 2$