

SHOW ALL YOUR WORK! GOOD LUCK!

NAME: _____

1. (6pts.) Solve for x .

$$2e^{3x} = 4e^{5x} \quad /:2$$

$$e^{3x} = 2e^{5x}$$

$$\ln e^{3x} = \ln 2 + \ln e^{5x}$$

$$3x \cdot \underbrace{\ln e}_{=1} = \ln 2 + 5x \cdot \underbrace{\ln e}_{=1}$$

$$3x = \ln 2 + 5x$$

$$2x = -\ln 2$$

$$x = -\frac{\ln 2}{2}$$

2. (4pts.) For $f(t) = 3t^2 - 2$ and $g(t) = t + 1$, find and simplify the following:

$$\begin{aligned} \text{a) } f(g(t)) &= f(t+1) = 3(t+1)^2 - 2 = 3(t^2 + 2t + 1) - 2 = 3t^2 + 6t + 3 - 2 \\ &= 3t^2 + 6t + 1 \end{aligned}$$

$$\text{b) } g(f(t)) = g(3t^2 - 2) = 3t^2 - 2 + 1 = 3t^2 - 1$$