

Show your work. You will not receive credit if you do not clearly show how you are obtaining your answers. Do all work on the exam.

1. (16 points) A 2013 Lexus LS costs \$75,480 and is expected to depreciate to \$27,600 after five years. a. Suppose the car's value decreases exponentially. Find a formula for the car's value, V , as a function of time, t .

$$V(t) = 75480 \cdot a^t = 27600 a^5$$

- b. Suppose the car's value decreases linearly. Find a formula for the car's value, V , as a function of

time, t .

$$(0, 75480) \quad (5, 27600)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{27600 - 75480}{5 - 0} = -9576$$

$$y = mx + b$$

$$V(t) = -9576x + 75480$$

- c. If this were your car and you were planning to trade it in for a new car after 3 years, which depreciation model, exponential or linear, would you prefer? Why?

$$\text{linear} = V(t) = -9576(3) + 75480 = 46752$$

$$\text{exponential} = V(t) = 75480 \cdot a^3$$

* I would use linear depreciation model, because on the long run, exponential's value is always higher than linear, while linear is stable at -9576

no

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