Topic 2.5: Exponential Function Context and Data Manipulation
Topic 2.6: Competing Function Model Validation

Using technology to find models to fit given data and discovering which model is the best for a real world situation.

Practice Problem 1

t	0	4
$M(t)$	3	0.047

The table gives certain values for the amount of medicine left in the bloodstream t hours after being administered. The data are modeled by the exponential function $M(t) = 3 \cdot \left(\frac{1}{2}\right)^{r \cdot t}$. Which of the following values would be an accurate value for the constant r?

(a) -8.831

(b) 1.499

(c) 8.831

(d) -1.499

Practice Problem 2

The speed at which water is being drained from the bottom of a vase is being recorded once per second over a two minute interval. For the first minute, the rate at which the water is draining is at a constant speed, after one minute, the water begins to drain faster until the last minute when it returns to the same speed it drained over the first minute. Which of the following best models this given situation?

(a) linear

(b) quadratic

(c) exponential

(d) There is not enough information to select a model.

Practice Problem 1 Solution:

(b) 1.499

Students will need to set up the equation $0.047 = 3 \cdot \left(\frac{1}{2}\right)^{4r}$ and solve using a graph, logarithms, etc., to get 1.499.

Practice Problem 2 Solution:

(b) quadratic

The constant speed, sudden increase, then returning to the original constant speed seems to fit the shape of a quadratic with a leading coefficient that is negative.