1. As part of a science experiment, data were collected from a swinging pendulum. The scatterplot was curved, so a transformation was applied before finding a least squares regression model. The transformed model was $\widehat{\text{period}} = -0.08594 + 0.21\sqrt{\text{length}}$, where period was measured in seconds and length was measured in centimeters. Use this model to predict the period when the length is 40cm.

2. As part of a study of water pollution, light levels were measured at various depths in a lake. The resulting scatterplot was curved, so a transformation was applied before finding a least squares model. The transformed model was $\ln\left(\widehat{\text{intensity}}\right) = 6.7891 - 0.333021(\text{depth})$, where light intensity was measured in lumens and depth was measured in meters. Use this model to predict the light intensity at a depth of 8.75m.

3. Biologists collected data from trees in a rainforest—specifically, the diameter (centimeters) and aboveground biomass (kilograms). The resulting scatterplot was nonlinear, so a transformation was applied. The transformed model was $\ln\left(\widehat{\text{biomass}}\right) = -2 + 2.42 \cdot \ln(\text{diameter})$. Use this model to predict the biomass for a tree 30cm in diameter.

4. A scatterplot appeared to follow the reciprocal function $y = a \cdot \frac{1}{x}$. What transformation should result in a linear scatterplot?

5. A scatterplot appeared to follow an exponential function $y = a \cdot n^x$. What transformation should result in a linear scatterplot?

6. Objects experiencing constant acceleration have a quadratic relationship between distance and time—in other words, $\text{distance} = a \cdot \text{time}^2$, where a is the constant of acceleration. What transformation should result in a linear scatterplot?