PROBLEM SOLVING

EXAMPLE 4 on p. 494 for Exs. 55–56

55. CAMERA PHONES The number of camera phones shipped globally can be modeled by the function $y = 1.28e^{1.31x}$ where x is the number of years since 1997 and y is the number of camera phones shipped (in millions). How many camera phones were shipped in 2002?

TEXAS @HomeTutor for problem solving help at classzone.com

56. BIOLOGY Scientists used traps to study the Formosan subterranean termite population in New Orleans. The mean number y of termites collected annually can be modeled by $y = 738e^{0.345t}$ where t is the number of years since 1989. What was the mean number of termites collected in 1999?

TEXAS @HomeTutor for problem solving help at classzone.com

EXAMPLE 5 on p. 495 for Exs. 57–58

57. FINANCE You deposit \$2000 in an account that pays 4% annual interest compounded continuously. What is the balance after 5 years?

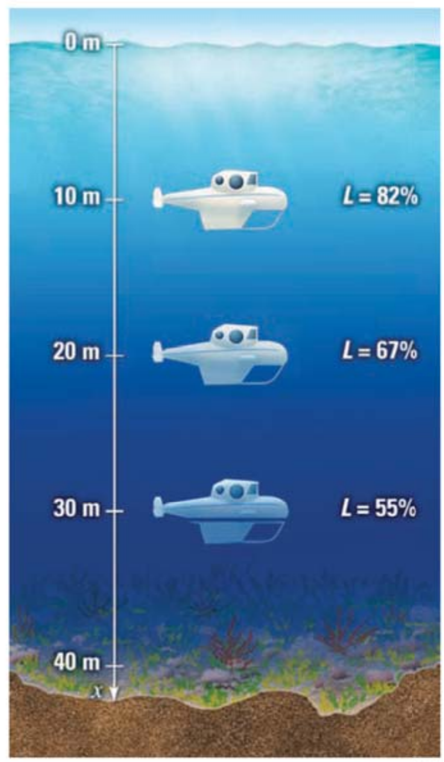
58. FINANCE You deposit \$800 in an account that pays 2.65% annual interest compounded continuously. What is the balance after 12.5 years?

59. MULTI-STEP PROBLEM The percent L of surface light that filters down through bodies of water can be modeled by the exponential function $L(x) = 100e^{kx}$ where k is a measure of the murkiness of the water and x is the depth below the surface (in meters).

a. A recreational submersible is traveling in clear water with a k-value of about -0.02. Write and graph an equation giving the percent of surface light that filters down through clear water as a function of depth.

b. Use your graph to estimate the percent of surface light available at a depth of 40 meters.

c. Use your graph to estimate how deep the submersible can descend in clear water before only 50% of surface light is available.



60. EXTENDED RESPONSE The growth of the bacteria *mycobacterium tuberculosis* can be modeled by the function $P(t) = P_0e^{0.116t}$ where $P(t)$ is the population after t hours and P_0 is the population when $t = 0$.

a. Model At 1:00 P.M., there are 30 *mycobacterium tuberculosis* bacteria in a sample. Write a function for the number of bacteria after 1:00 P.M.

b. Graph Graph the function from part (a).

c. Estimate What is the population at 5:00 P.M.?

d. Reasoning *Describe* how to find the population at 3:45 P.M.