

Practice the following problems using definitions and properties of exponential and logarithmic functions with natural base e .

Given $\ln 4 = 1.3863$ and $\ln 5 = 1.6094$, use properties of natural logarithms to find each value. Do not use a calculator.

28. $\ln 20$

28. 2.9957

38. $\ln\left(\frac{e}{5}\right)$

38. -0.6094

Solve for t . Round the answer to three decimal places.

42. $e^{2t} = 1000$

42. 3.454

48. $8e^{3t} = 25$

48. 0.380

Solve each logarithmic equation. Round the answer to three decimal places

66. $3 - 5 \ln(3x - 2) = 10$

66. $\frac{1}{3}(e^{-1.4} + 2) \approx 0.749$

68. $\ln(x + 2) + \ln x = \ln 24$

68. 4

- 74. Value of a stock.** The value of a share of St. Lawrence Corporation stock, t weeks after being purchased, is given by

$$V(t) = 140 - 80e^{-0.0225t}.$$

- a) What is the value of the share after 35 weeks?
- b) What was the original purchase price of the share?
- c) When will the share of stock be worth \$125?

74. (a) \$103.60; (b) \$60; (c) after 74.4 weeks

- 76. Demand.** The price, in dollars per unit, that consumers are willing to pay for the Trailmaster mountain bike is given by

$$p(x) = 980 - 90 \ln x,$$

where x is in thousands of units.

- a) What price corresponds to a demand of 150,000 units?
- b) How many units will consumers buy at a price of \$400 per bicycle?

76. (a) \$529.04; (b) about 629 thousand units