

Exponential and Logarithmic Functions Answers

1. Answers will vary. *Sample answers:*

a. $E = 70^\circ$; table values: 200° ; 160° ; 131° ; 112° ; 99° ; 90° ; 83°

b. For $t = 20$, $k \approx 0.075$; for $t = 5$, $k \approx 0.074$; for $t = 10$, $k \approx 0.076$; for $t = 15$, $k \approx 0.075$

c. $T(t) = 70 + 130e^{-0.075t}$; $k = 0.075$ was chosen because it is the average and it occurred most often.

d. $T(30) \approx 83.7^\circ$; This is very close to $T_{30} = 83^\circ$.

e. $T(35) \approx 79.4^\circ$; $T(45) \approx 74.4^\circ$

2. a. yes; The caffeine in the patient's bloodstream will be $49.2 < 50$ milligrams.

b. up to 231.3 mg

3. a. $P(t) = \frac{1030}{1 + 1029e^{-1.64t}}$

b. 4 days

4. a. no; After 9 weeks of training, the athlete can complete the 5-kilometer race in about 21 minutes, 6 seconds.

b. 42