

23 Which of the three situations given below is best modeled by an exponential function?

- I. A bacteria culture doubles in size every day.
- II. A plant grows by 1 inch every 4 days.
- III. The population of a town declines by 5% every 3 years.

- (1) I, only
- (2) II, only
- (3) I and II
- (4) I and III

34 A car was purchased for \$25,000. Research shows that the car has an average yearly depreciation rate of 18.5%.

Create a function that will determine the value, $V(t)$, of the car t years after purchase.

Determine, to the *nearest cent*, how much the car will depreciate from year 3 to year 4.

14 Which situation is *not* a linear function?

- (1) A gym charges a membership fee of \$10.00 down and \$10.00 per month.
- (2) A cab company charges \$2.50 initially and \$3.00 per mile.
- (3) A restaurant employee earns \$12.50 per hour.
- (4) A \$12,000 car depreciates 15% per year.

26 Caleb claims that the ordered pairs shown in the table below are from a nonlinear function.

x	f(x)
0	2
1	4
2	8
3	16

State if Caleb is correct. Explain your reasoning.

33 A population of rabbits in a lab, $p(x)$, can be modeled by the function $p(x) = 20(1.014)^x$, where x represents the number of days since the population was first counted.

Explain what 20 and 1.014 represent in the context of the problem.

Determine, to the *nearest tenth*, the average rate of change from day 50 to day 100.

- 2 Jill invests \$400 in a savings bond. The value of the bond, $V(x)$, in hundreds of dollars after x years is illustrated in the table below.

x	$V(x)$
0	4
1	5.4
2	7.29
3	9.84

Which equation and statement illustrate the approximate value of the bond in hundreds of dollars over time in years?

- (1) $V(x) = 4(0.65)^x$, and it grows.
 - (2) $V(x) = 4(0.65)^x$, and it decays.
 - (3) $V(x) = 4(1.35)^x$, and it grows.
 - (4) $V(x) = 4(1.35)^x$, and it decays.
- 5 Ian is saving up to buy a new baseball glove. Every month he puts \$10 into a jar. Which type of function best models the total amount of money in the jar after a given number of months?
- (1) linear
 - (2) exponential
 - (3) quadratic
 - (4) square root