Write

Describe how you can distinguish between an independent quantity and a dependent quantity. Use an example in your description.

Remember

When one quantity is determined by another in a problem situation, it is said to be the dependent quantity. The quantity it is determined from is called the independent quantity. The independent quantity is represented on the *x*-axis and the dependent quantity is represented on the *y*-axis.

Practice

Visit **livehint.com/texas** or use this QR code if you need a hint on the Practice questions.

1. Read each scenario and identify the independent and dependent quantities. Be sure to include the appropriate units of measure. Then analyze each graph and determine which of the provided scenarios it models. For each graph, label the *x*- and *y*-axis with the appropriate quantity and unit of measure.
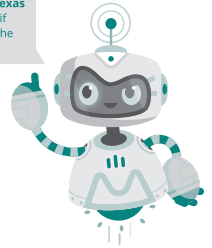
a. Endangered Species
The Elkwood Aquatic Society is working with various reptile species to increase their populations. The initial population of 450 endangered turtles tripled each year for the past five years.

c. Sales Commission
Julian works as a salesman. He receives a monthly salary of $3000 as well as a 10% commission on the amount of sales.

e. Commuter Flight
A commuter flight between two cities in Oregon takes about 40 minutes. The plane increases its altitude for the first half of the flight until it gets to 18,000 feet, and then it descends for the second half of the flight. The plane ascends and descends at a constant rate of 900 feet per minute.
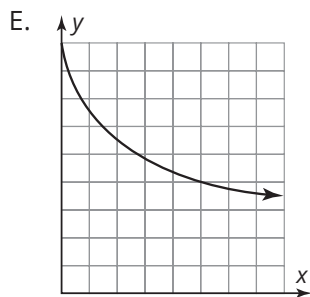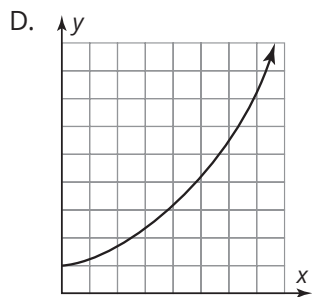
b. Video Games
Gillian is playing video games at an arcade. Gillian starts with $40 and is playing games that cost 50 cents per game.
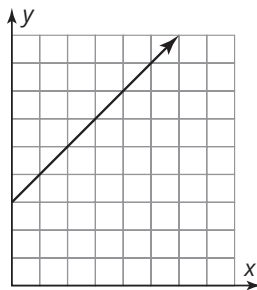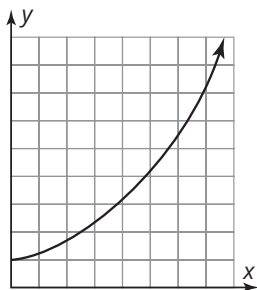
d. Cooling Tea
A freshly made cup of tea is served at a temperature of about 180°F. The tea cools rapidly at first, and then slows down gradually as it approaches room temperature.

A.

B.

C.

D.

E.
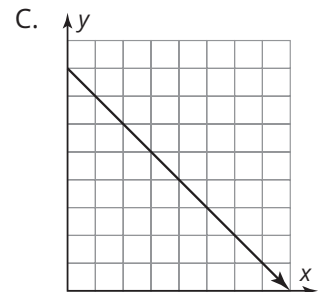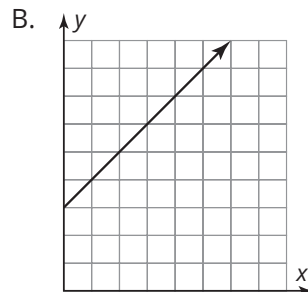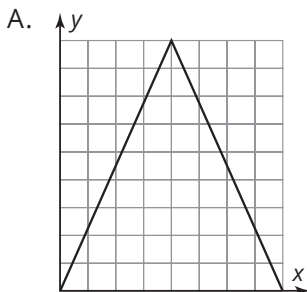
2. Compare the pair of graphs and describe any similarities and differences you notice.

Stretch

Read the scenario and identify the independent and dependent quantities. Be sure to include the appropriate units of measure.

1. A student performs several experiments in which he swings a pendulum for a 20-second duration. He uses a string that is 27 cm long, and he tests pendulum masses of different sizes, varying from 2 to 12 grams. He records the number of swings each pendulum makes in 20 seconds.
2. The student then decides to make a second graph showing the string length (in cm) as the independent quantity. What changes must the student make to his experiment?

Review

1. Solve the equation $-2x + 8 = -3x + 14$.
2. Evaluate the expression $x^2 - 3y + 12$ for $x = -2$ and $y = 5$.