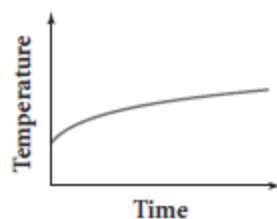


LESSON 7.3 • Graphs of Real-World Situations

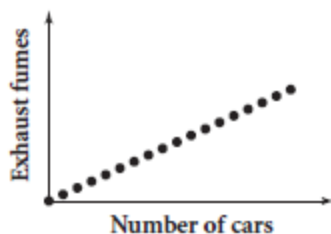
1. Graphs and explanations will vary.

- a. Independent variable: time; dependent variable: temperature



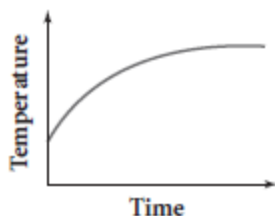
Sample explanation: Cold milk will start warming quickly. It will warm less quickly as it approaches the temperature of the air. The graph is nonlinear, continuous, and increasing. (After considerable time, the graph will stop increasing and become a horizontal line at room temperature.)

- b. Independent variable: number of cars; dependent variable: level of exhaust fumes



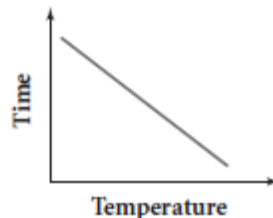
Sample explanation: As the number of cars increases, the level of fumes in the air increases. The level of exhaust fumes is directly related to the number of cars (a direct variation). The graph is a series of collinear points falling on a line through $(0, 0)$ with positive slope. The graph is linear, discrete, and increasing.

- c. Independent variable: time; dependent variable: temperature



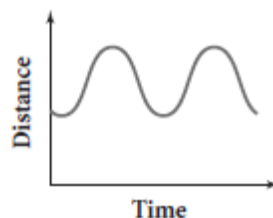
Sample explanation: The water increases in temperature over time. At first, it increases more quickly, and later, more slowly. If it continues to heat until boiling, it will maintain a constant temperature of about 100°C . Initially, the graph is nonlinear, increasing, and continuous. After the water reaches the boiling point, the graph stops increasing and becomes a horizontal line.

- d. Independent variable: temperature; dependent variable: time



Sample explanation: The relationship between temperature and time (for temperatures associated with an oven) is a roughly decreasing, linear relationship. The lower the temperature, the longer the time. *Note:* This model does not apply when the temperature is very low or very high. In these regions of the graph, the relationship is not linear but is still decreasing.

- e. Independent variable: time; dependent variable: distance from the rider to the ground



Sample explanation: The graph starts just before the lowest point of the Ferris wheel rotation. So the graph dips down, then rises to the top, and then goes back to the low point again. This cycle repeats for each rotation of the Ferris wheel. The graph is a smooth, continuous curve; no part of it is linear.

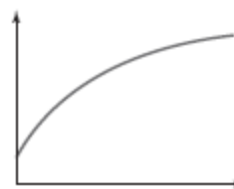
2. a.



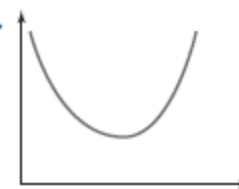
b.



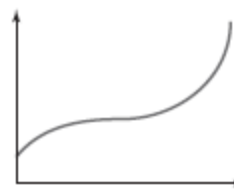
c.



d.



e.



3. a. $-6 \leq x < -5$ b. $-5 \leq x < 0$
c. $-6 \leq x < -2$ d. $-5 \leq x < 5$
e. $-2 \leq x < 5$ f. $-2 \leq x < 0$

4. a. Nonlinear and decreasing with a faster and faster rate of change
b. Linear and decreasing with a constant rate of change
c. Nonlinear and increasing with a faster and faster rate of change