


30.  **TAKS REASONING** Give an example of two real-life quantities that show direct variation. *Explain* your reasoning.

EXAMPLE 3

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for Exs. 31–34

IDENTIFYING DIRECT VARIATION Tell whether the data in the table show direct variation. If so, write an equation relating x and y .

31.

x	3	6	9	12	15
y	-1	-2	-3	-4	-5

32.

x	1	2	3	4	5
y	7	9	11	13	15

33.

x	-5	-4	-3	-2	-1
y	20	16	12	8	4

34.

x	-8	-4	4	8	12
y	8	4	-4	-8	-12

35. **ERROR ANALYSIS** A student tried to determine whether the data pairs (1, 24), (2, 12), (3, 8), and (4, 6) show direct variation. *Describe* and correct the error in the student's work.

$1 \cdot 24 = 24$ $2 \cdot 12 = 24$
 $3 \cdot 8 = 24$ $4 \cdot 6 = 24$

Because the products xy are constant, y varies directly with x .

36. **REASONING** Let (x_1, y_1) be a solution, other than $(0, 0)$, of a direct variation equation. Write a second direct variation equation whose graph is perpendicular to the graph of the first equation.
37. **CHALLENGE** Let (x_1, y_1) and (x_2, y_2) be any two distinct solutions of a direct variation equation. Show that $\frac{x_2}{x_1} = \frac{y_2}{y_1}$.

PROBLEM SOLVING

EXAMPLE 2


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for Exs. 38–40

38. **SCUBA DIVING** The time t it takes a diver to ascend safely to the surface varies directly with the depth d . It takes a minimum of 0.75 minute for a safe ascent from a depth of 45 feet. Write an equation that relates d and t . Then predict the minimum time for a safe ascent from a depth of 100 feet.

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39. **WEATHER** Hail 0.5 inch deep and weighing 1800 pounds covers a roof. The hail's weight w varies directly with its depth d . Write an equation that relates d and w . Then predict the weight on the roof of hail that is 1.75 inches deep.

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40.  **TAKS REASONING** Your weight M on Mars varies directly with your weight E on Earth. If you weigh 116 pounds on Earth, you would weigh 44 pounds on Mars. Which equation relates E and M ?

- Ⓐ $M = E - 72$ Ⓑ $44M = 116E$ Ⓒ $M = \frac{29}{11}E$ Ⓓ $M = \frac{11}{29}E$

EXAMPLE 3

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for Exs. 41–43

41. **INTERNET DOWNLOADS** The ordered pairs $(4.5, 23)$, $(7.8, 40)$, and $(16.0, 82)$ are in the form (s, t) where t represents the time (in seconds) needed to download an Internet file of size s (in megabytes). Tell whether the data show direct variation. If so, write an equation that relates s and t .