

7.1 Exercises

Vocabulary and Core Concept Check

- VOCABULARY** Explain how direct variation equations and inverse variation equations are different.
- DIFFERENT WORDS, SAME QUESTION** Which is different? Find “both” answers.

What is an inverse variation equation relating x and y with $a = 4$?

What is an equation for which the ratios $\frac{y}{x}$ are constant and $a = 4$?

What is an equation for which y varies inversely with x and $a = 4$?

What is an equation for which the products xy are constant and $a = 4$?

Monitoring Progress and Modeling with Mathematics

In Exercises 3–10, tell whether x and y show *direct variation*, *inverse variation*, or *neither*. (See Example 1.)

- $y = \frac{2}{x}$
- $xy = 12$
- $\frac{y}{x} = 8$
- $4x = y$
- $y = x + 4$
- $x + y = 6$
- $8y = x$
- $xy = \frac{1}{5}$

In Exercises 11–14, tell whether x and y show *direct variation*, *inverse variation*, or *neither*. (See Example 2.)

11.

x	12	18	23	29	34
y	132	198	253	319	374

12.

x	1.5	2.5	4	7.5	10
y	13.5	22.5	36	67.5	90

13.

x	4	6	8	8.4	12
y	21	14	10.5	10	7

14.

x	4	5	6.2	7	11
y	16	11	10	9	6

In Exercises 15–22, the variables x and y vary inversely. Use the given values to write an equation relating x and y . Then find y when $x = 3$. (See Example 3.)

- $x = 5, y = -4$
- $x = 1, y = 9$
- $x = -3, y = 8$
- $x = 7, y = 2$
- $x = \frac{3}{4}, y = 28$
- $x = -4, y = -\frac{5}{4}$
- $x = -12, y = -\frac{1}{6}$
- $x = \frac{5}{3}, y = -7$

ERROR ANALYSIS In Exercises 23 and 24, the variables x and y vary inversely. Describe and correct the error in writing an equation relating x and y .

23. $x = 8, y = 5$

~~X~~

$$y = ax$$

$$5 = a(8)$$

$$\frac{5}{8} = a$$

$$\text{So, } y = \frac{5}{8}x.$$

24. $x = 5, y = 2$

~~X~~

$$xy = a$$

$$5 \cdot 2 = a$$

$$10 = a$$

$$\text{So, } y = 10x.$$