

8-1

Practice

Form K

Inverse Variation

Is the relationship between the values in each table a *direct variation*, an *inverse variation*, or *neither*? Write an equation to model the direct and inverse variations.

1.

x	y
0.1	3
3	0.1
6	0.05
24	0.0125

inverse variation; $y = \frac{0.3}{x}$

2.

x	y
1	3
2	6
5	15
6	18

direct variation; $y = 3x$

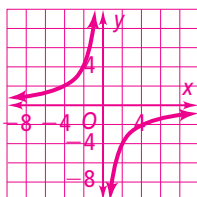
3.

x	y
0	1
2	5
4	7
6	8

neither

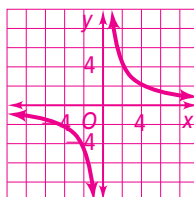
Suppose that x and y vary inversely. Write a function that models each inverse variation. Graph the function and find y when $x = 10$.

4. $x = 2$ when $y = -4$



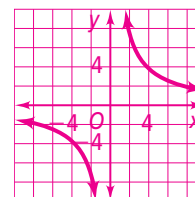
$y = -\frac{8}{x}; -\frac{4}{5}$

5. $x = -9$ when $y = -1$



$y = \frac{9}{x}; \frac{9}{10}$

6. $x = 1.5$ when $y = 10$



$y = \frac{15}{x}; 1.5$

7. Suppose the table at the right shows the time t it takes to drive home when you travel at various average speeds s .

a. Write a function that models the relationship between the speed and the time it takes to drive home. $s = \frac{10}{t}$

b. At what speed would you need to drive to get home in 50 min or $\frac{5}{6}$ h? **12 mi/h**

Time t (h)	Speed s (mi/h)
$\frac{1}{6}$	60
$\frac{1}{4}$	40
$\frac{1}{3}$	30
$\frac{3}{4}$	13.3

8-1

Practice (continued)

Form K

Inverse Variation

Use combined variation to solve each problem.

8. The height h of a cylinder varies directly with the volume of the cylinder and inversely with the square of the cylinder's radius r with the constant equal to $\frac{1}{\pi}$.
- Write a formula that models this combined variation. $h = \frac{V}{\pi r^2}$
 - What is the height of a cylinder with radius 4 m and volume 500 m^3 ?
Use 3.14 for π and round to the nearest tenth of a meter. **10.0 m**

9. Some students volunteered to clean up a highway near their school. The amount of time it will take varies directly with the length of the section of highway and inversely with the number of students who will help. If 25 students clean up 5 mi of highway, the project will take 2 h. How long would it take 85 students to clean up 34 mi of highway? **4 h**

Write the function that models each variation. Find z when $x = 2$ and $y = 6$.

10. z varies inversely with x and directly with y . When $x = 5$ and $y = 10$, $z = 2$. $z = \frac{y}{x}; 3$
11. z varies directly with the square of x and inversely with y . When $x = 2$ and $y = 4$, $z = 3$. $z = \frac{3x^2}{y}; 2$

Each ordered pair is from an inverse variation. Find the constant of variation.

12. (2, 2)
 $k = 4$

13. (1, 8)
 $k = 8$

14. (9, 4)
 $k = 36$

Each pair of values is from an inverse variation. Find the missing value.

15. (9, 5), (x, 3)
 $x = 15$

16. (8, 7), (5, y)
 $y = 11.2$

17. (2, 7), (x, 1)
 $x = 14$