

2.5 Model Direct Variation

pp. 107–111

EXAMPLE

The variables x and y vary directly, and $y = 76$ when $x = -8$. Write an equation that relates x and y . Then find y when $x = -6$.

$y = ax$ Write direct variation equation.

$76 = a(-8)$ Substitute 76 for y and -8 for x .

$-9.5 = a$ Solve for a .

An equation that relates x and y is $y = -9.5x$. When $x = -6$, $y = -9.5(-6) = 57$.

EXERCISES

The variables x and y vary directly. Write an equation that relates x and y . Then find y when $x = 3$.

19. $x = 6, y = -48$

20. $x = -9, y = 15$

21. $x = -3, y = 2.4$

22. **PHYSICS** Charles's Law states that when pressure is constant, the volume V of a gas varies directly with its temperature T (in kelvins). A gas occupies 4.8 liters at a temperature of 300 kelvins. Write an equation that gives V as a function of T . What is the volume of the gas when the temperature is 420 kelvins?

EXAMPLE 2

on p. 108
for Exs. 19–22

2.6 Draw Scatter Plots and Best-Fitting Lines

pp. 113–120

EXAMPLE

The table shows the shoe size x and height y (in inches) for 7 men. Approximate the best-fitting line for the data.

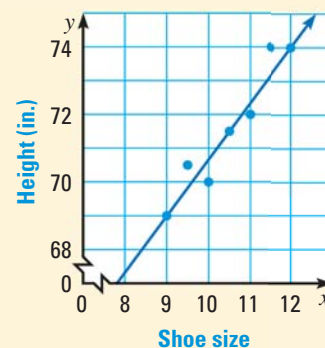
x	9	9.5	10	10.5	11	11.5	12
y	69	70.5	70	71.5	72	74	74

Draw a scatter plot and sketch the line that appears to best fit the data points.

Choose two points on the line, such as (9, 69) and (12, 74). Use the points to find an equation of the line.

The slope is $m = \frac{74 - 69}{12 - 9} = \frac{5}{3} \approx 1.67$.

An equation is $y - 69 = 1.67(x - 9)$, or $y = 1.67x + 54$.



EXERCISES

Approximate the best-fitting line for the data.

23.

x	-2	-1	0	1	2	3	4	5
y	4	3	2.5	2	0.5	-1	-2	-3

EXAMPLE 3

on p. 115
for Ex. 23