

DIRECT VARIATION

_____ is a special type of linear relationship that can be written in the form of $y = kx$, where k is called the **constant of variation**.

The graph of a **direct variation** equation $y = kx$ is a line with the following properties:

- The line passes through the origin, which means the y-intercept is (0, 0).
- The slope of the line is k .

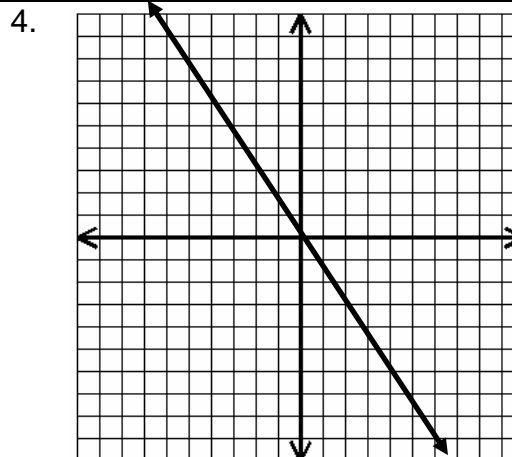
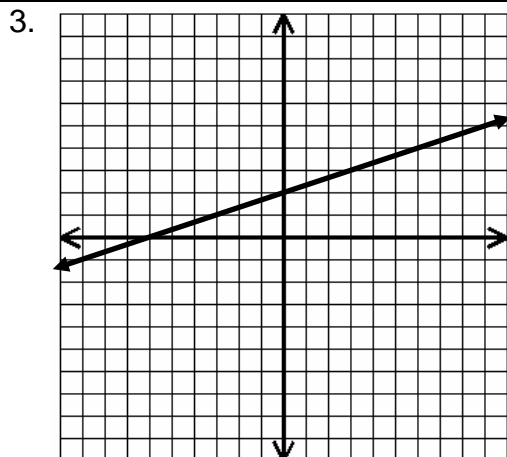
Determine if the relationship is a direct variation. If so, write the equation.

1.

x	1	3	5
y	6	18	30

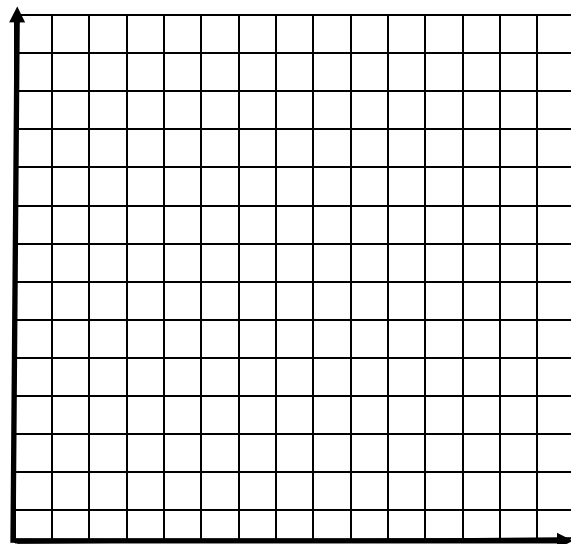
2.

x	y
-3	-7
1	9
3	17



Answer the following.

5. The number of hamburgers that can be made varies directly with the weight of ground beef that is used. Five hamburgers can be produced for every two pounds of ground beef. Write a direct variation equation for the number of hamburgers y that can be made from x pounds of ground beef. Then graph the relationship.



6. Suppose the value of y varies directly with x , and $y = 24$ when $x = 18$.

What direct variation equation relates x and y ? _____

What is the value of y when x is 12? _____

What is the value of x when y is -8? _____

7. The mass of a substance varies directly with the volume of the substance. Eighty liters of the substance has a mass of 100 kilograms. What is the volume, in liters, of 3.2 kilograms of the substance?

8. The total cost of filling up a car with gas varies directly with the number of gallons of gasoline purchased. You put 15 gallons of gas in your car for \$33.75.

Write an equation that relates x , the number of gallons of gasoline purchased and y , the total cost.

How much does it cost for 20 gallons of gas? _____

How much does it cost for 18 gallons of gas? _____

If the total cost is \$27, how many gallons were purchased? _____

Weight on Mars y varies directly with weight on Earth x . A science instrument that weighs 130 lbs on Earth weighs 50 lbs on Mars.

What is an equation that relates weight, in pounds, on Earth x and weight on Mars y ?

An object that weighs 205 lbs on Earth weighs _____ lbs on Mars.

An object that weighs _____ lbs on Earth weighs 19 lbs on Mars.