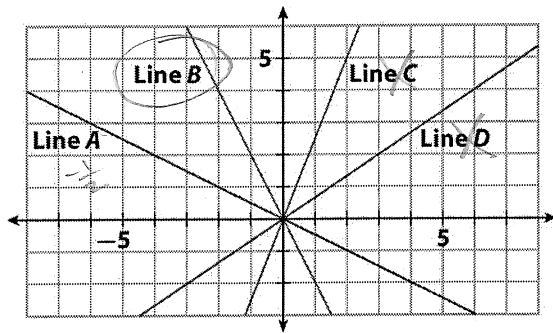


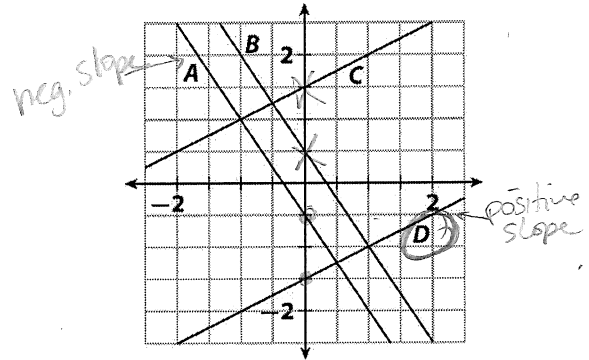
# Linear Functions

1. Which line has a slope of -2?



Line B

2. Which line has a slope of  $\frac{1}{2}$  and a negative y-intercept?

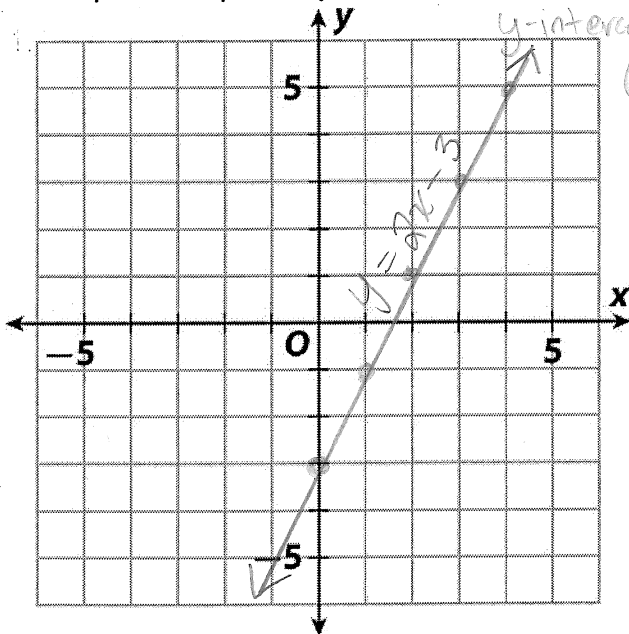


Line D

3. Graph the equation  $y = 2x - 3$ .

$m = 2 = \frac{2}{1}$

y-intercept  $(0, -3)$



4. The fuel mileage of a hybrid vehicle is shown in the table below.

Fuel (gal)	6	9	27	40
Distance (mi)	192	288	864	1280

$\frac{192}{6} = 32$   $\frac{288}{9} = 32$   $\frac{864}{27} = 32$   $\frac{1280}{40} = 32$

- a. Determine if the relationship is a direct variation. yes  
If so, write an equation that describes the relationship.

$y = 32x$

- b. How many miles can the car drive on 11 gallons of fuel? 352 miles

$32 \times 11$   
352

5. What is the slope and y-intercept of the graph of  $y = 3x + 5$ ?

$y = mx + b$   
 slope = 3  
 y-intercept = (0, 5)

6. Which statement **cannot** be true of the graph of a proportional relationship?

- A It is not linear. **F**
- B It is a straight line. **T**
- C It includes the origin. **T**
- D It shows a constant ratio. **T**

7. Which equation shows a proportional relationship?

- A  $y = \frac{1}{2}x + \frac{1}{2}$
- B  $y = 2x + 2$
- C  $y = \frac{1}{2}x$
- D  $y = \frac{2}{x}$

8. Does the data show direct variation? Write yes or no. If the data shows direct variation, identify the constant of variation and write an equation to describe the relationship.

Thickness (in.)	1	2	3	4
R-value	3.14	6.28	9.42	12.56

$\frac{3.14}{1} = 3.14$      $\frac{6.28}{2} = 3.14$      $\frac{9.42}{3} = 3.14$      $\frac{12.56}{4} = 3.14$

Direct variation: **yes** no (circle one)

If yes, constant of variation:  $k = \underline{3.14}$

Equation:  $y = 3.14x$

9. On a two-week job, a repairman works a total of 70 hours. He charges \$75 plus \$40 per hour. An equation shows this relationship, where  $x$  is the number of hours and  $y$  is the total fee.

Write the equation for this situation:  $y = 75 + 40x$

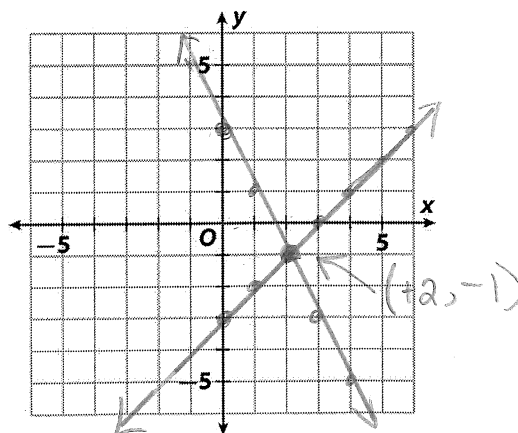
Identify the slope (rate of change): 40

What is the y-intercept? (0, 75)

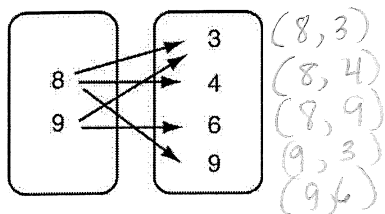
10. Solve this system by graphing.

$$\begin{cases} y = -2x + 3 \\ y = x - 3 \end{cases}$$

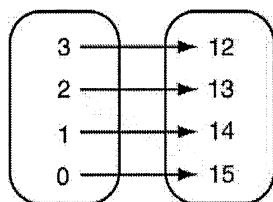
Solution  
(2, -1)



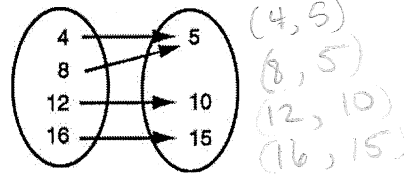
11-20. Identify whether or not each represents a function and explain why or why not.



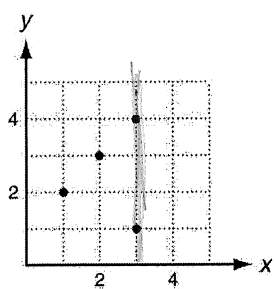
NO  
x-values repeat



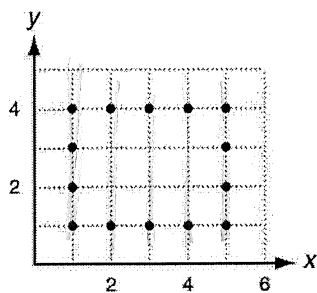
YES  
x-values are unique



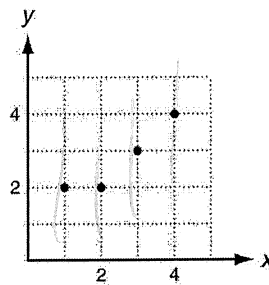
YES  
x-values are unique



NO  
fails the vertical line test



NO  
fails the vertical line test



YES  
passes the vertical line test so all x-values are unique.

Input	0	1	2	3
Output	4	1	0	4

YES  
x-values (input) are unique

Input	1	2	0	1	2
Output	4	5	6	7	8

NO  
x-values (#1 + #2) repeat.

$\{(0, 0), (2, 4), (3, 6), (5, 5), (7, 6)\}$

YES  
all x-values are unique.

$\{(0, 8), (1, 2), (3, 7), (5, 9), (3, 6)\}$

NO  
x-values (3) repeat.