

2.3 The Slope of a Line

Slope
Slope-Intercept Form of a Line
Interpreting Slope in Applications

Key Terms

Use the vocabulary terms listed below to complete the statements in exercises 1-6.

undefined**negative**

$$y = mx + b$$

positive**zero**

$$y - y_1 = m(x - x_1)$$

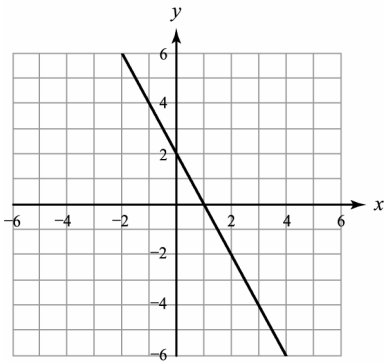
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

1. The formula for the slope of a line is _____.
2. If a line has _____ slope, the line rises from left to right.
3. If a line has _____ slope, the line falls from left to right.
4. If the slope of a line is _____, the line is horizontal.
5. If the slope of a line is _____, the line is vertical.
6. The slope-intercept form a line is _____.

Slope

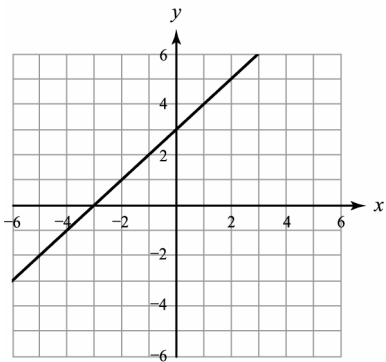
Exercises 1-3: Determine the slope of each line shown.

1.



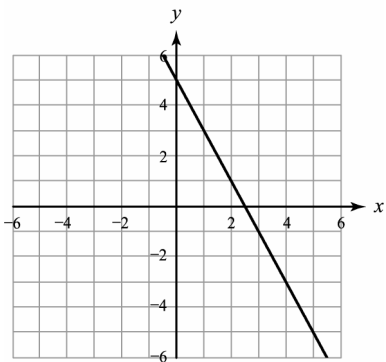
1. _____

2.



2. _____

3.



3. _____

Exercises 4-8: Find the slope of the line passing through each pair of points, if possible.

4. $(-4, 0)$ and $(2, 1)$ 4. _____

5. $(2, -1)$ and $(5, 2)$ 5. _____

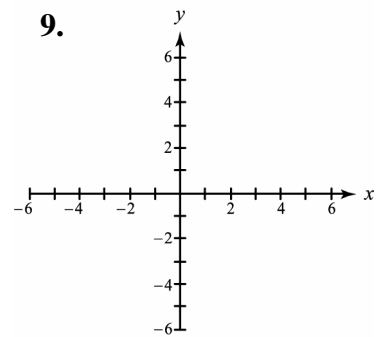
6. $(0, 5)$ and $(-3, -1)$ 6. _____

7. $(\frac{1}{2}, -\frac{1}{2})$ and $(2, 2)$ 7. _____

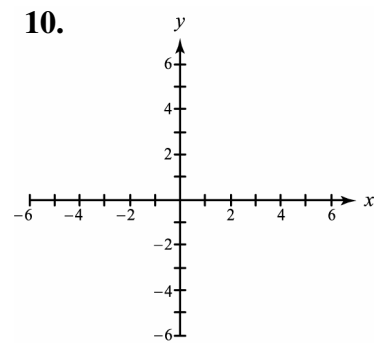
8. $(-\frac{1}{4}, 0)$ and $(\frac{1}{2}, -\frac{1}{2})$ 8. _____

Exercises 9-11: Sketch a line passing through the given point with slope m .

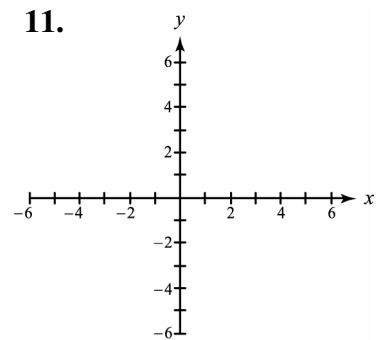
9. $(1,1)$; $m = 3$



10. $(-3,3)$; $m = -\frac{1}{3}$



11. $(2,-3)$; $m = 0$



Slope-Intercept Form of a Line

Exercises 12-16: Identify the slope and y-intercept for each line.

12. $y = x - 4$

12. _____

13. $y = -\frac{1}{4}x + \frac{3}{2}$

13. _____

14. $y = -3x$

14. _____

15. $y = 6$

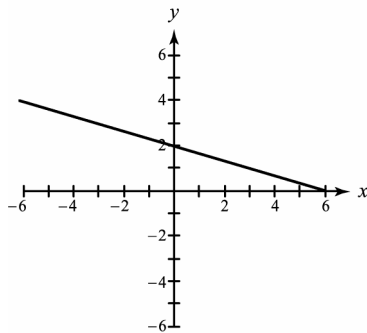
15. _____

16. $y = 5 - 7x$

16. _____

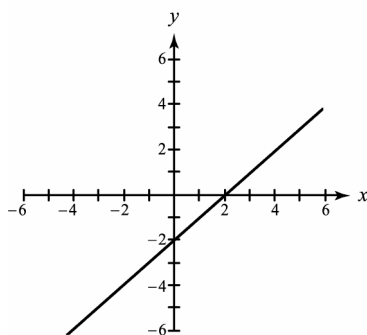
Exercises 17-19: Use the graph to express the line in slope-intercept form.

17.



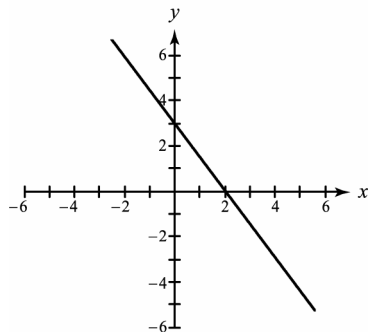
17. _____

18.



18. _____

19.



19. _____

Exercises 20-23: Write the slope-intercept form for the line satisfying the following conditions.

20. Slope -2 ; y-intercept 6

20. _____

21. Slope 0 ; y-intercept -3

21. _____

22. Passing through $(1, 0)$ and $(-4, 0)$

22. _____

23. Passing through $(0, \frac{1}{2})$ and $(2, \frac{3}{2})$

23. _____

Exercises 24-27: Let $f(x)$ represent a linear function.

(a) Find the missing value in the table.

(b) Write the slope-intercept form for f .

24.

x	-1	0	1
$f(x)$	-2	-3	?

24. (a) _____

(b) _____

25.

x	0	1	2
$f(x)$?	-4	-8

25. (a) _____

(b) _____

26.

x	-1	0	1
$f(x)$	-2	-2	?

26. (a) _____

(b) _____

27.

x	-2	0	2
$f(x)$	-2	-1	?

27. (a) _____

(b) _____

Interpreting Slope in Applications

Exercises 28 and 29: Water is being drained from a pool. The amount of water W (in gallons) in the pool after t minutes is given by $W(t) = 2000 - 40t$.

28. (a) Evaluate $W(0)$. Interpret the result.

28. (a) _____

(b) Evaluate $W(30)$. Interpret the result.

(b) _____

29. What is the slope of the graph of W ? Interpret this slope.

29. _____

30. A salesperson earns a salary of \$3200 per month plus a \$100 commission for each sale made.

(a) Write a linear function that models the monthly earnings of the salesperson.

30. (a) _____

(b) What is the slope of the graph? Interpret this slope.

(b) _____