

2.4 Equations of Lines and Linear Models

Point-Slope Form
Horizontal and Vertical Lines
Parallel and Perpendicular Lines

Key Terms

Use the vocabulary terms listed below to complete the statements in exercises 1-5.

parallel	$x = h$	$y = mx + b$
perpendicular	$y = b$	$y = m(x - x_1) + y_1$
		$m = \frac{y_2 - y_1}{x_2 - x_1}$

1. The point-slope form of a line is _____.
2. _____ represents the equation of a horizontal line.
3. _____ represents the equation of a vertical line.
4. Two lines are _____ if they have the same slope.
5. Two lines are _____ if the product of their slopes is -1 .

Point-Slope Form

Exercises 1-4: Find a point-slope form of the line satisfying the given conditions.

1. Slope 2, passing through $\left(\frac{3}{2}, -1\right)$ **1.** _____

2. Slope 0, passing through $\left(-2, \frac{3}{4}\right)$ **2.** _____

3. Passing through $(1, -4)$ and $(2, -2)$ **3.** _____

4. Passing through $\left(0, \frac{5}{2}\right)$ and $\left(2, \frac{1}{2}\right)$ **4.** _____

Exercises 5-8: Write in slope-intercept form.

5. $y = -2(x-1) + 6$

5. _____

6. $y = \frac{1}{2}(x-5) + \frac{3}{2}$

6. _____

7. $y = -\frac{1}{3}(x+6) + 4$

7. _____

8. $y = -\frac{3}{2}(x+4) + 6$

8. _____

Exercises 9-12: Find the slope-intercept form of the line satisfying the given conditions.

9. Slope $\frac{2}{3}$, passing through $(0, -1)$

9. _____

10. Passing through $(0, -3)$ and $(2, -1)$

10. _____

11. x -intercept 1, y -intercept -2

11. _____

12. x -intercept $\frac{1}{2}$, y -intercept $\frac{3}{2}$

12. _____

Exercises 13-16: Find a line $y = mx + b$ that models the data in each table.

13.

x	0	4	8	12	16
y	2	5	8	11	14

13. _____

14.

x	0	2	4	6	8
y	3	6	9	12	15

14. _____

15.

x	0	2	4	6	8
y	7	8	9	10	11

15. _____

16.

x	0	4	8	12	16
y	1	2	3	4	5

16. _____

Horizontal and Vertical Lines

Exercises 17-22: Find an equation of the line satisfying the given conditions.

17. Vertical, passing through $(-2, 3)$ 17. _____

18. Vertical, passing through $(\frac{2}{3}, \frac{5}{3})$ 18. _____

19. Horizontal, passing through $(\frac{1}{2}, -\frac{1}{2})$ 19. _____

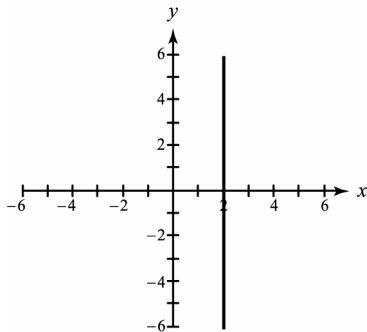
20. Horizontal, passing through $(0, 7)$ 20. _____

21. Passing through $(2, 0)$ and $(-3, 0)$ 21. _____

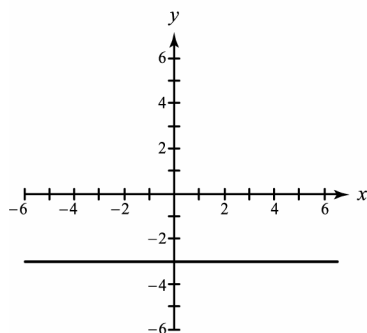
22. Passing through $(-\frac{1}{2}, 4)$ and $(-\frac{1}{2}, 1)$ 22. _____

Exercises 23-24: Find an equation of the graph shown.

23. 23. _____



24. 24. _____



Parallel and Perpendicular Lines

Exercises 25-27: Find the slope-intercept form of the line satisfying the giving conditions.

25. Parallel to $y = 4x + 1$, passing through $(-1, -2)$ 25. _____

26. Passing through $(-2, 0)$ and parallel to the line passing through $(2, 1)$ and $(-3, 0)$ 26. _____

27. Parallel to $y = -\frac{1}{2}$, passing through $(\frac{5}{3}, -\frac{1}{3})$ 27. _____

28. Perpendicular to $y = \frac{3}{2}x - 4$, passing through $(6, -2)$ 28. _____

29. Passing through $(-1, 1)$ and perpendicular to the line passing through $(2, 1)$ and $(-3, 0)$ 29. _____

30. Perpendicular to $x = 3$, passing through $(-2.1, 3.3)$ 30. _____