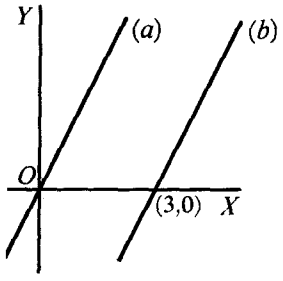
Exercises [A-2]

In exercises 1–6 find the slope, x-intercept, y-intercept for each line. Use the intercepts to make a rough sketch of each graph. Check the slope.

1. $y = 2x - 8$
2. $x + 3y = 9$
3. $5x - 2y + 20 = 0$
4. $x + y = 6$
5. $y = \frac{2}{3}x + 2$
6. $3x + 2y - 4 = 0$

7. Find the equation of the line with slope 2 and y-intercept -3.
8. Find the equation of the line with slope $-\frac{2}{3}$ and y-intercept 2.
9. Find the equation of the line with slope $-\frac{1}{2}$ and y-intercept 0.
10. Which of the graphs (a) and (b) represents a direct-variation relationship between y and x? Find the equations of the graphs if the slope of each is 2.



11. The graph of a direct-variation relationship between y and x passes through the points (x_1, y_1), (x_2, y_2). Show that

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

Find the equations of the straight lines determined by the given conditions in exercises 12–24.

12. The line through $(-4, 2)$ with slope 1.
13. The line through $(-3, 2)$ with slope $-\frac{2}{3}$.
14. The line through $(0, 6)$ with slope $\frac{3}{2}$.
15. The line through $(-\frac{1}{2}, -2)$ with slope 2.
16. The line through $(-2, 1)$ and $(8, 6)$.
17. The line through $(3, 0)$ and $(0, 2)$.
18. The line through the origin with slope -2.
19. The line through $(0, -4)$ and $(6, -4)$.

20. The line through $(5, 0)$ and $(5, 8)$.
21. The line through $(-3, 2)$ parallel to $x + 3y = 0$.
22. The line through $(-2, -1)$ perpendicular to $x + 4y = 0$.
23. The line through $(4, 3)$ perpendicular to $2x + 3y + 6 = 0$.
24. The line through $(3, -1.5)$ perpendicular to $2x - 5y - 14 = 0$.
25. (a) Find the equation of the perpendicular bisector of the line segment joining $A(1, 3)$ and $B(-3, 5)$.
    (b) If the perpendicular bisector meets the y-axis at P, find the lengths PA and PB.
26. (a) Find the equation of the perpendicular bisector of the line segment joining $A(2, 3)$ and $B(4, -5)$.
    (b) If the perpendicular bisector meets the x-axis at P, find the lengths PA and PB.

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1. Slope = 2

   x-intercept = 4

   y-intercept = -8

2. Slope = $-\frac{1}{3}$

   x-intercept = 9

   y-intercept = 3

3. Slope = $\frac{5}{2}$

   x-intercept = -4

   y-intercept = 10

4. Slope = -1

   x-intercept = 6

   y-intercept = 6

5. Slope = $\frac{2}{3}$

   x-intercept = -3

   y-intercept = 2

6. Slope = $-\frac{3}{2}$

   x-intercept = $\frac{4}{3}$

   y-intercept = 2

7. $y = 2x - 3$

8. $y = -\frac{2}{3}x + 2$

9. $y = -\frac{1}{2}x$

10. Graph (a)

    Equation of (a): $y = 2x$

    Equation of (b): $y = 2x - 6$

12. $x - y + 6 = 0$

13. $2x + 3y = 0$

14. $3x - 2y + 12 = 0$

15. $2x - y - 1 = 0$

16. $x - 2y + 4 = 0$

17. $2x + 3y - 6 = 0$

18. $2x + y = 0$

19. $y + 4 = 0$

20. $x - 5 = 0$

21. $x + 3y - 3 = 0$

22. $4x - y + 7 = 0$

23. $3x - 2y - 6 = 0$

24. $5x + 2y - 12 = 0$

25. a. $2x - y + 6 = 0$

    b. $PA = \sqrt{10} = PB$

26. a. $x - 4y - 7 = 0$

    b. $PA = \sqrt{34} = PB$