

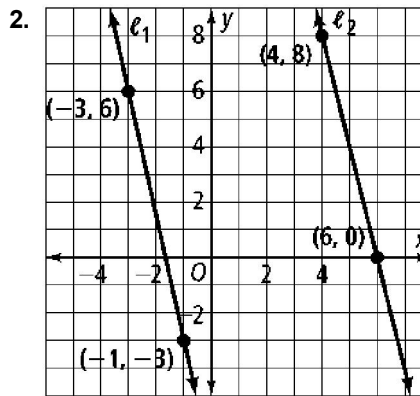
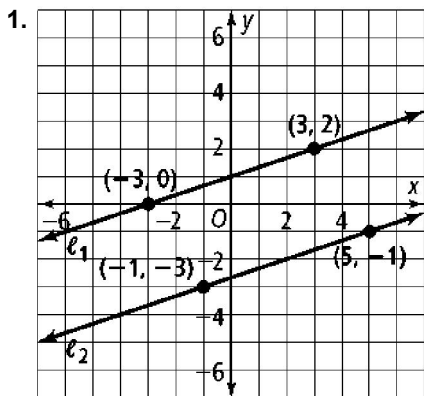
# 3-8

## Practice

Form K

### Slopes of Parallel and Perpendicular Lines

For Exercises 1 and 2, are lines  $l_1$  and  $l_2$  parallel? Explain.



Write an equation of the line parallel to the given line that contains  $C$ .

3.  $C(5, -2); y = -5x + 3$

4.  $C(8, 1); y = 2x + 6$

5.  $C(4, 3); y = -\frac{1}{4}x + 3$

6.  $C(0, 6); y = \frac{2}{3}x + 3$

Rewrite each equation in slope-intercept form, if necessary. Then determine whether the lines are parallel. Explain.

7.  $y = x + 8$

8.  $2y + 6x = 18$

9.  $4y - 3x = 20$

$x - 2y = 4$

$4y + 12x = 24$

$2y = \frac{3}{2}x + 4$

Use slopes to determine whether the opposite sides of quadrilateral  $WXYZ$  are parallel.

10.  $W(-1, -1), X(-3, -1), Y(-2, 4), Z(2, 3)$

11.  $W(-1, 1), X(2, 4), Y(4, 1), Z(1, -2)$

12.  $W(3, 1), X(5, -4), Y(0, -4), Z(-2, 0)$

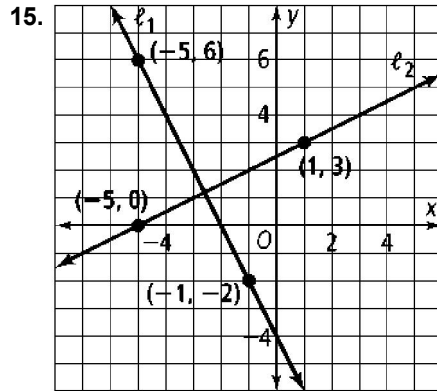
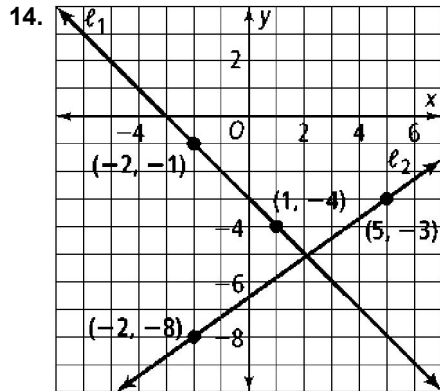
13.  $W(-1, -1), X(2, -4), Y(0, -5), Z(-3, -2)$

# 3-8 Practice (continued)

## Slopes of Parallel and Perpendicular Lines

Form K

For Exercises 14 and 15, are  $l_1$  and  $l_2$  perpendicular? Explain.



Write an equation of the line perpendicular to the given line that contains  $D$ .

16.  $D(6, 2); y = -3x + 5$

17.  $D(0, -3); y = \frac{1}{2}x - 7$

18.  $D(-8, 1); y = -\frac{2}{3}x + 4$

19.  $D(2, 2); y = 5x + 3$

20. **Think About a Plan** Line  $l_1$  contains  $(-2, 1)$  and  $(4, 3)$  and line  $l_2$  contains  $(5, 3)$  and  $(3, g)$ . What value of  $g$  makes  $l_1$  and  $l_2$  perpendicular?

- For  $l_1$  and  $l_2$  to be perpendicular, what must be true of their slopes?
- What equation is true if  $l_1 \perp l_2$ ?

21. A classmate plotted the following points:  $A(-3, 2)$ ,  $B(-1, 4)$ , and  $C(1, 2)$ . Where should the classmate plot point  $D$  so that the quadrilateral formed has perpendicular sides?

22. **Open-Ended** Write the coordinates of a set of points which can be found on a line perpendicular to the line containing points  $A(5, 3)$  and  $B(8, 5)$ .

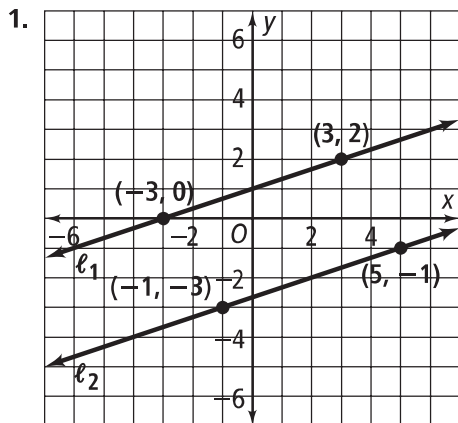
# 3-8

## Practice

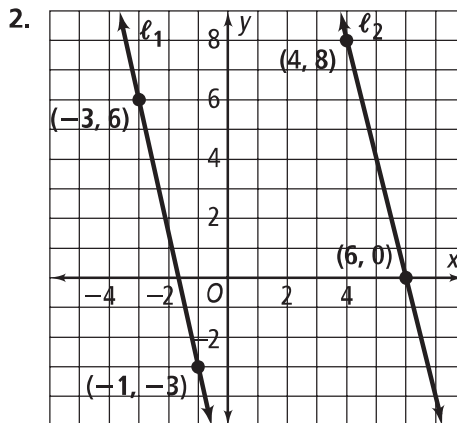
Form K

### Slopes of Parallel and Perpendicular Lines

For Exercises 1 and 2, are lines  $\ell_1$  and  $\ell_2$  parallel? Explain.



Yes; both lines have a slope of  $\frac{1}{3}$ .



No; slope of  $\ell_1$  is  $-\frac{9}{2}$  and slope of  $\ell_2$  is  $-4$ .

Write an equation of the line parallel to the given line that contains C.

3. C(5, -2);  $y = -5x + 3$

$y = -5x + 23$

4. C(8, 1);  $y = 2x + 6$

$y = 2x - 15$

5. C(4, 3);  $y = -\frac{1}{4}x + 3$

$y = -\frac{1}{4}x + 4$

6. C(0, 6);  $y = \frac{2}{3}x + 3$

$y = \frac{2}{3}x + 6$

Rewrite each equation in slope-intercept form, if necessary. Then determine whether the lines are parallel. Explain.

7.  $y = x + 8$

$x - 2y = 4$

$y = \frac{1}{2}x - 2$ ; No; slope of first line is 1 and slope of second line is  $\frac{1}{2}$ .

8.  $2y + 6x = 18$

$4y + 12x = 24$

$y = -3x + 9$ ;  
 $y = -3x + 6$ ; yes; both lines have a slope of  $-3$ .

9.  $4y - 3x = 20$

$2y = \frac{3}{2}x + 4$

$y = \frac{3}{4}x + 5$ ;  $y = \frac{3}{4}x + 2$ ; yes; both lines have a slope of  $\frac{3}{4}$ .

Use slopes to determine whether the opposite sides of quadrilateral WXYZ are parallel.

10. W(-1, -1), X(-3, -1), Y(-2, 4), Z(2, 3) **no**

11. W(-1, 1), X(2, 4), Y(4, 1), Z(1, -2) **yes;  $\overline{WX} \parallel \overline{ZY}$**

12. W(3, 1), X(5, -4), Y(0, -4), Z(-2, 0) **no**

13. W(-1, -1), X(2, -4), Y(0, -5), Z(-3, -2) **yes;  $\overline{WX} \parallel \overline{ZY}$  and  $\overline{WZ} \parallel \overline{XY}$**

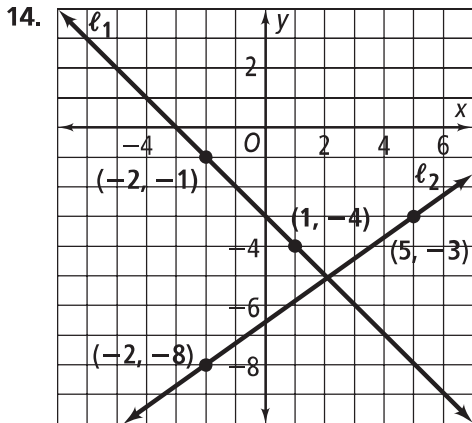
# 3-8

## Practice (continued)

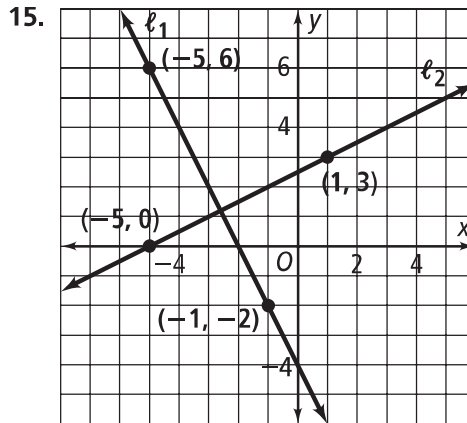
Form K

### Slopes of Parallel and Perpendicular Lines

For Exercises 14 and 15, are  $\ell_1$  and  $\ell_2$  perpendicular? Explain.



No; slope of  $\ell_1$  is  $-1$  and slope of  $\ell_2$  is  $\frac{5}{5}$ .



Yes; slope of  $\ell_1$  is  $-2$  and slope of  $\ell_2$  is  $\frac{1}{2}$ .

Write an equation of the line perpendicular to the given line that contains  $D$ .

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

17.  $D(0, -3)$ ;  $y = \frac{1}{2}x - 7$   
 $y = -2x - 3$

18.  $D(-8, 1)$ ;  $y = -\frac{2}{3}x + 4$   
 $y = \frac{3}{2}x + 13$

19.  $D(2, 2)$ ;  $y = 5x + 3$   
 $y = -\frac{1}{5}x + 2\frac{2}{5}$

20. **Think About a Plan** Line  $\ell_1$  contains  $(-2, 1)$  and  $(4, 3)$  and line  $\ell_2$  contains  $(5, 3)$  and  $(3, g)$ . What value of  $g$  makes  $\ell_1$  and  $\ell_2$  perpendicular? **9**

- For  $\ell_1$  and  $\ell_2$  to be perpendicular, what must be true of their slopes?  
**Their product must be  $-1$ .**
- What equation is true if  $\ell_1 \perp \ell_2$ ?

$$\frac{3-1}{4+2} \times \frac{g-3}{3-5} = -1$$

21. A classmate plotted the following points:  $A(-3, 2)$ ,  $B(-1, 4)$ , and  $C(1, 2)$ . Where should the classmate plot point  $D$  so that the quadrilateral formed has perpendicular sides?  **$(-1, 0)$**

22. **Open-Ended** Write the coordinates of a set of points which can be found on a line perpendicular to the line containing points  $A(5, 3)$  and  $B(8, 5)$ .

**Answers will vary. Check that students' lines have a slope of  $-\frac{3}{2}$ .**