Answers for Lesson 3-7, pp. 177–179 Exercises

1. Yes; both slopes $= -\frac{1}{2}$.

2. No; the slope of $\ell_1 = \frac{1}{3}$ and the slope of $\ell_2 = \frac{1}{2}$.

3. No; the slope of $\ell_1 = \frac{3}{2}$, and the slope of $\ell_2 = 2$.

4. Yes; both slopes $= 4$.

5. Yes; both slopes $= 0$.

6. Yes; the lines both have a slope of 2 but different y-intercepts.

7. Yes; the lines both have a slope of $\frac{3}{4}$ but different y-intercepts.

8. Yes; the lines both have a slope of -1 but different y-intercepts.

9. No; one slope $= 7$ and the other slope $= -7$.

10. No; one slope $= -\frac{3}{4}$ and the other slope $= -3$.

11. Yes; the lines both have a slope of $-\frac{2}{5}$ but different y-intercepts.

12. $y - 3 = -2(x - 0)$ or $y - 3 = -2x$

13. $y - 0 = \frac{1}{3}(x - 6)$ or $y = \frac{1}{3}(x - 6)$

14. $y - 4 = \frac{1}{2}(x + 2)$

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

16. Yes; the slope of $\ell_1 = -\frac{1}{2}$, and the slope of $\ell_2 = 2$; $-\frac{1}{2} \cdot 2 = -1$.

17. Yes; the slope of $\ell_1 = -\frac{3}{2}$, and the slope of $\ell_2 = \frac{2}{3}$; $-\frac{3}{2} \cdot \frac{2}{3} = -1$.

18. No; the slope of $\ell_1 = -1$, and the slope of $\ell_2 = \frac{4}{5}$; $-1 \cdot \frac{4}{5} \neq -1$.

19. Yes; the slope of $\ell_1 = -1$, and the slope of $\ell_2 = 1$; $-1 \cdot 1 = -1$.

20–23. Answers may vary. Samples are given.

20. $y - 6 = -\frac{3}{2}(x - 6)$

21. $y = -2(x - 4)$

22. $y - 4 = \frac{1}{2}(x - 4)$

23. $y = \frac{4}{5}x$

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

25. Yes; $1 \cdot (-1) = -1$.

26. Yes; one is vertical and the other is horizontal.

27. No; $\frac{2}{7} \cdot \left(-\frac{7}{4}\right) \neq -1$.

28. A

29. slope of $\overline{AB}$ = slope of $\overline{CD} = \frac{2}{3}$; $\overline{AB} \parallel \overline{CD}$
slope of $\overline{BC}$ = slope of $\overline{AD} = -3$; $\overline{BC} \parallel \overline{AD}$

30. slope of $\overline{AB}$ = slope of $\overline{CD} = -\frac{3}{4}$; $\overline{AB} \parallel \overline{CD}$
slope of $\overline{BC}$ = slope of $\overline{AD} = 1$; $\overline{BC} \parallel \overline{AD}$

31. slope of $\overline{AB} = \frac{1}{2}$; slope of $\overline{CD} = \frac{1}{4}$; $\overline{AB} \nparallel \overline{CD}$
slope of $\overline{BC} = -1$; slope of $\overline{AD} = -\frac{1}{2}$; $\overline{BC} \nparallel \overline{AD}$

32. slope of $\overline{AB}$ = slope of $\overline{CD} = 0$; $\overline{AB} \parallel \overline{CD}$
slope of $\overline{BC} = 3$ and slope of $\overline{AD} = \frac{3}{2}$; $\overline{BC} \nparallel \overline{AD}$

33. Answers may vary. Sample: $y = \frac{4}{5}x + 5$, $y = -\frac{5}{4}x + 5$

34. No; two $\parallel$ lines with the same y-intercept are the same line.

35. $\overline{RS}$ and $\overline{VU}$ are horizontal with slope $= 0$; $\overline{RS} \parallel \overline{VU}$;
slope of $\overline{RW}$ = slope of $\overline{UT} = 1$; $\overline{RW} \parallel \overline{UT}$;
slope of $\overline{WV}$ = slope of $\overline{ST} = -1$; $\overline{WV} \parallel \overline{ST}$

36. No; because no pairs of slopes have a product of -1.

37. The lines will have the same slope.

38. When lines are $\perp$, the product of their slopes is -1. So, two lines $\perp$ to the same line must have the same slope.

39. **a.** $y + 20 = \frac{3}{4}(x - 35)$

b. because you are given a point and can quickly find the slope

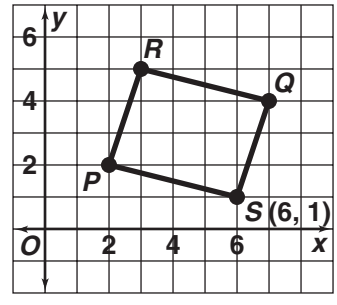
40. $\parallel$ **41.** $\perp$ **42.** neither

43. $\perp$ **44.** $\perp$

45. $\overline{AC}$: $d = \sqrt{(7 - 9)^2 + (11 - 1)^2} = \sqrt{104}$
$\overline{BD}$: $d = \sqrt{(13 - 3)^2 + (7 - 5)^2} = \sqrt{104}$
$\overline{AC} \cong \overline{BD}$

46. slope of $\overline{AC} = -5$; slope of $\overline{BD} = \frac{1}{5}$; since $-5 \cdot \frac{1}{5} = -1$, $\overline{AC} \perp \overline{BD}$; midpoint $\overline{AC} = (8, 6)$; midpoint $\overline{BD} = (8, 6)$; since the midpoints are the same, the diagonals bisect each other.

47. **a–b.** Answers may vary.
Sample:



c. The other possible locations for S are $(-2, 3)$ and $(8, 7)$.

48. $y - 5 = \frac{1}{3}(x - 4)$