Answers for Lesson 6-3, pp. 324–326 Exercises

1. 5

2. $x = 3, y = 4$

3. $x = 1.6, y = 1$

4. $\frac{5}{3}$

5. 5

6. 13

7. Yes; both pairs of opp. sides are $\cong$.

8. No; the quad. could be a kite.

9. Yes; both pairs of opp. $\angle$s are $\cong$.

10. It remains a $\square$ because the shelves and connecting pieces remain $\parallel$.

11. A quad. is a $\square$ if and only if opp. sides are $\cong$ (6-1 and 6-5); opp. $\angle$s are $\cong$ (6-2 and 6-6); diags. bis. each other (6-3 and 6-7).

12. a. Distr. Prop.

   b. Div. Prop. of Eq.

   c. $\overline{AD} \parallel \overline{BC}, \overline{AB} \parallel \overline{DC}$

   d. If same-side int. $\angle$s are suppl., the lines are $\parallel$.

   e. Def. of $\square$

13. Draw diagonals $\overline{TX}$ and $\overline{WY}$ intersecting at R.

   a. $\overline{TW} \cong \overline{YX}$ (Given)

   b. $\angle TWR \cong \angle XYR$ (Alt. Int. $\angle$s $\cong$)

   c. $\angle WTR \cong \angle YXR$ (Alt. Int. $\angle$s $\cong$)

   d. $\triangle TWR \cong \triangle YXR$ (ASA)

   e. $\overline{WR} \cong \overline{YR}$ (CPCTC)

   f. $\overline{TR} \cong \overline{XR}$ (CPCTC)

   g. The diagonals bisect each other. (def. of bis.)

   h. $TWXY$ is a $\square$ (Thm. 6-7).
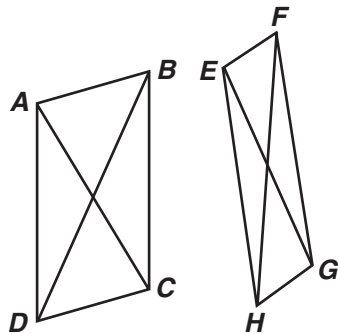
14. $x = 15, y = 25$

15. $x = 3, y = 11$

16. $c = 8, a = 24$

17. $k = 9, m = 23.4$

18. D

19. Answers may vary. Sample:

20. $\angle JKN \cong \angle LMN$ (given), $\angle LKN \cong \angle JMN$ (given), and $\overline{MK} \cong \overline{MK}$, so $\triangle JKM \cong \triangle LMK$ by ASA. $\overline{JK} \cong \overline{ML}$ and $\overline{MJ} \cong \overline{LK}$ (CPCTC), so $JKLM$ is a $\square$ because opp. sides are $\cong$ (Thm. 6-5).

21. $\triangle TRS \cong \triangle RTW$ (given), so $\overline{ST} \cong \overline{RW}$ and $\overline{SR} \cong \overline{TW}$. $RSTW$ is a $\square$ because opp. sides are $\cong$ (Thm. 6-5).

22. $(4, 0)$

23. $(6, 6)$

24. $(-2, 4)$

25. You can show a quad. is a $\square$ if both pairs of opp. sides are $\parallel$ or $\cong$, if both pairs of opp. $\angle$s are $\cong$, if diagonals bisect each other, if all consecutive $\angle$s are suppl., or if one pair of opp. sides is both $\parallel$ and $\cong$.

26. $\frac{1}{6}$

27. Answers may vary. Sample:

   1. $\overline{AB} \cong \overline{CD}, \overline{AC} \cong \overline{BD}$ (Given)

   2. $ACDB$ is a $\square$. (If opp. sides of a quad. are $\cong$, then it is a $\square$.)

   3. M is the midpoint of $\overline{BC}$. (The diag. of a $\square$ bisect each other.)

   4. $\overline{AM}$ is a median. (Def. of a median)

28. $G(-4, 1), H(1, 3)$