Answers for Lesson 6-2, pp. 315–318 Exercises

1. 127 **2.** 67

3. 76 **4.** 124

5. 100 **6.** 118

7. 3; 10, 20, 20 **8.** 22; 18.5, 23.6, 23.6

9. 20 **10.** 18 **11.** 17

12. 12; $m\angle Q = m\angle S = 36, m\angle P = m\angle R = 144$

13. 6; $m\angle H = m\angle J = 30, m\angle I = m\angle K = 150$

14. $x = 6, y = 8$ **15.** $x = 5, y = 7$

16. $x = 7, y = 10$ **17.** $x = 6, y = 9$

18. $x = 3, y = 4$ **19.** 12; 24

20. Pick 4 equally spaced lines on the paper. Place the paper so that the first button is on the first line and the last button is on the fourth line. Draw a line between the first and last buttons. The remaining buttons should be placed where the drawn line crosses the 2 $\parallel$ lines on the paper.

21. 3 **22.** 3 **23.** 6 **24.** 6

25. 9 **26.** 2.25 **27.** 2.25 **28.** 4.5

29. 4.5 **30.** 6.75

31. $BC = AD = 14.5$ in.; $AB = CD = 9.5$ in.

32. $BC = AD = 33$ cm; $AB = CD = 13$ cm

33. A

34. The opp. ∠s are $\cong$, so they have = measures. Consecutive ∠s are suppl., so their sum is 180.

35. **a.** $\overline{DC}$

b. $\overline{AD}$

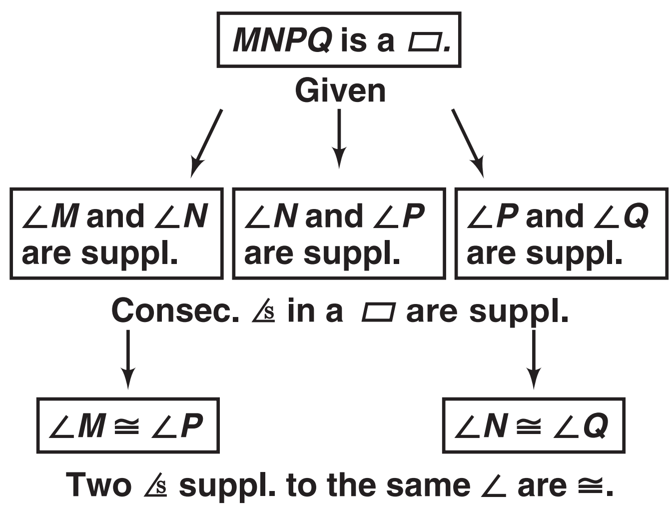
c. $\cong$

d. Reflexive

e. ASA

f. CPCTC

36.



37. 38, 32, 110 **38.** 81, 28, 71 **39.** 95, 37, 37

40. The lines going across may not be $\parallel$ since they are not marked as $\parallel$.

41. 18, 162

42. Answers may vary. Sample:

1. *LENS* and *NGTH* are ▱s. (Given)

2. $\angle ELS \cong \angle ENS$ and $\angle GTH \cong \angle GNH$ (Opp. $\angle$s of a ▱ are $\cong$.)

3. $\angle ENS \cong \angle GNH$ (Vertical $\angle$s are $\cong$.)

4. $\angle ELS \cong \angle GTH$ (Trans. Prop. of $\cong$)

43. Answers may vary. Sample: In ▱s $LENS$ and $NGTH$, $\overline{GT} \parallel \overline{EH}$ and $\overline{EH} \parallel \overline{LS}$ by the def. of a ▱. Therefore $\overline{LS} \parallel \overline{GT}$ because if 2 lines are $\parallel$ to the same line then they are $\parallel$ to each other.

44. Answers may vary. Sample:

1. $LENS$ and $NGTH$ are ▱s. (Given)

2. $\angle GTH \cong \angle GNH$ (Opp. ∠s of a ▱ are $\cong$.)

3. $\angle ENS \cong \angle GNH$ (Vertical ∠s are $\cong$.)

4. $\angle LEN$ is supp. to $\angle ENS$ (Consec. ∠s in a ▱ are suppl.)

5. $\angle ENS \cong \angle GTH$ (Trans. Prop. of $\cong$)

6. $\angle E$ is suppl. to $\angle T$. (Suppl. of $\cong$ ∠s are suppl.)

45. $x = 12, y = 4$

46. $x = 0, y = 5$

47. $x = 9, y = 6$

48. Answers may vary. Sample: In ▱ $RSTW$ and ▱ $XYTZ$, $\angle R \cong \angle T$ and $\angle X \cong \angle T$ because opp. ∠s of a ▱ are $\cong$. Then $\angle R \cong \angle X$ by the Trans. Prop. of $\cong$.

49. In ▱ $RSTW$ and ▱ $XYTZ$, $\overline{XY} \parallel \overline{TW}$ and $\overline{RS} \parallel \overline{TW}$ by the def. of a ▱. Then $\overline{XY} \parallel \overline{RS}$ because if 2 lines are $\parallel$ to the same line, then they are $\parallel$ to each other.

50. $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \parallel \overline{BC}$ by def. of ▱. $\angle 2 \cong \angle 3$ and $\angle 1 \cong \angle 4$ by alt. int. ∠s. $\angle 1 \cong \angle 2$ by def. of $\angle$ bisect., so $\angle 3 \cong \angle 4$ by Trans. Prop. of $\cong$.

51. a. Answers may vary. Check students' work.

b. No; the corr. sides can be $\cong$ but the ∠s may not be.

52. a. $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD} \parallel \overleftrightarrow{EF}$ and $\overline{AC} \cong \overline{CE}$ (Given)

b. $ABGC$ and $CDHE$ are parallelograms. (Def. of a ▱)

c. $\overline{BG} \cong \overline{AC}$ and $\overline{DH} \cong \overline{CE}$ (Opp. sides of a ▱ are $\cong$.)

d. $\overline{BG} \cong \overline{DH}$ (Trans. Prop. of $\cong$)

e. $\overline{BG} \parallel \overline{DH}$ (If 2 lines are $\parallel$ to the same line, then they are $\parallel$ to each other.)

f. $\angle 2 \cong \angle 1$, $\angle 1 \cong \angle 4$, $\angle 4 \cong \angle 5$, and $\angle 3 \cong \angle 6$ (If 2 lines are $\parallel$, then the corr. $\angle$s are $\cong$.)

g. $\angle 2 \cong \angle 5$ (Trans. Prop. of $\cong$)

h. $\triangle BGD \cong \triangle DHF$ (AAS)

i. $\overline{BD} \cong \overline{DF}$ (CPCTC)

53. a. Given: 2 sides and the included $\angle$ of ▱$ABCD$ are $\cong$ to the corr. parts of ▱$WXYZ$. Let $\angle A \cong \angle W$, $\overline{AB} \cong \overline{WX}$ and $\overline{AD} \cong \overline{WZ}$. Since opp. $\angle$s of a ▱ are $\cong$, $\angle A \cong \angle C$ and $\angle W \cong \angle Y$. Thus $\angle C \cong \angle Y$ by the Trans. Prop. of $\cong$. Similarly, opp. sides of a ▱ are $\cong$, thus $\overline{AB} \cong \overline{CD}$ and $\overline{WX} \cong \overline{ZY}$. Using the Trans. Prop. of $\cong$, $\overline{CD} \cong \overline{ZY}$. The same can be done to prove $\overline{BC} \cong \overline{XY}$. Since consec. $\angle$s of a ▱ are suppl., $\angle A$ is suppl. to $\angle D$, and $\angle W$ is suppl. to $\angle Z$. Suppls. of $\cong$ $\angle$s are $\cong$, thus $\angle D \cong \angle Z$. The same can be done to prove $\angle B \cong \angle X$. Therefore, since all corr. $\angle$s and sides are $\cong$, ▱$ABCD \cong$ ▱$WXYZ$.

b. No; opp. $\angle$s and sides are not necessarily $\cong$ in a trapezoid.