Answers for Lesson 7-5, pp. 400–404 Exercises

1. 7.5

2. 8

3. 5.2

4. *d*

5. *c*

6. *b*

7. *d*

8. 7.5

9. $3\frac{1}{3}$

10. 9.6

11. 6

12. 4.8

13. 35

14. 3.6

15. $\frac{40}{7}$

16. 12

17. *KS*

18. *SQ*

19. *JP*

20. *KP*

21. *KM*

22. *PM*

23. *JP*

24. *LW*

25. 559 ft

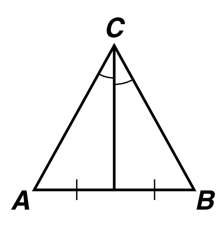
26. 671 ft

27. 2.4 cm and 2.6 cm; 3.3 cm and 8.7 cm; 3.8 cm and 9.2 cm

28. Answers may vary. Sample: 9 cm and 13.5 cm

29. $x = 18$ m; $y = 12$ m

30. **a.**



b. isosceles; △-∠ Bisector Thm.

31. 20

32. 2.5

33. $\frac{2}{7}$, 3

34. **a.** Given

b. Prop. of Proportions

c. Segment Add. Post.

d. Reflexive Prop. of $\cong$

e. SAS $\sim$ Thm.

f. Corr. ∠s of $\sim$ △s are $\cong$.

g. If corr. ∠s are $\cong$, lines are $\|$.

35. **a.** $\frac{AB}{BC}$

b. $\frac{WX}{XY}$

c. $\frac{AB}{BC} = \frac{WX}{XY}$

36. Yes; since $\frac{6}{10} = \frac{9}{15}$, the segments are $\|$ by the Converse of the Side-Splitter Thm.

37. No; $\frac{28}{12} \neq \frac{24}{10}$.

38. Yes; since $\frac{15}{12} = \frac{20}{16}$, the segments are $\|$ by the Converse of the Side-Splitter Thm.

39. Measure $\overline{AC}$, $\overline{CE}$, and $\overline{BD}$. Use the Side-Splitter Thm. Write the proport. $\frac{AC}{CE} = \frac{AB}{BD}$ and solve for AB.

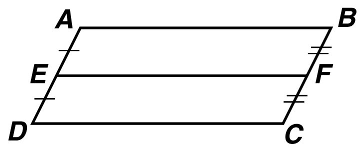
40. 4.5 cm or 12.5 cm

41. 6 **42.** 2.5 **43.** 19.5

44. The two segments are x and y. $\frac{x}{y} = \frac{ks}{s} = k$, so $x = ky$.

45. a. A midsegment of a ▱ connects the midpts. of 2 opp. sides.

b.



Given: ▱$ABCD$ with $\overline{EF}$ connecting the midpts. of $\overline{AD}$ and $\overline{BC}$ Prove: $\overline{AB} \parallel \overline{EF}$; $\overline{EF} \parallel \overline{CD}$

1. ▱$ABCD$ (Given)

2. $\overline{AE} \parallel \overline{BF}$ and $\overline{ED} \parallel \overline{FC}$ (Def. of ▱)

3. $\overline{AD} \cong \overline{BC}$ (Opp. sides of ▱ are ≅.)

4. E and F are midpts. of $\overline{AD}$ and $\overline{BC}$. (Given)

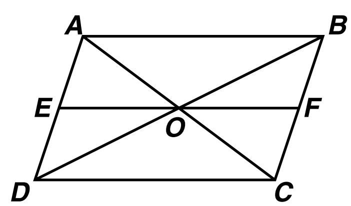
5. $AE = ED = \frac{1}{2}AD$; $BF = FC = \frac{1}{2}BC$ (Def. of midpt.)

6. $AE = BF$, $ED = FC$ (Subst.)

7. $ABFE$ and $EFCD$ are ▱s (If one pair of opp. sides of a quad. is ≅ and ∥, it is a ▱.)

8. $\overline{AB} \parallel \overline{EF}$ and $\overline{EF} \parallel \overline{CD}$ (Opp. sides of a ▱ are ∥.)

c.



Given: ▱$ABCD$ with midsegment $\overline{EF}$ Prove: $\overline{EF}$ bisects $\overline{AC}$ and $\overline{BD}$. Since $\overline{AB} \parallel \overline{EF} \parallel \overline{DC}$ by part (b), and $\overline{EF}$ bisects $\overline{AD}$, by the Side-Splitter Thm., $\overline{EF}$ bisects $\overline{AC}$ and $\overline{BD}$.

46. If a ray passes through the vertex of an angle of a triangle and splits the opposite side into segments that are proportional to the other two sides of the triangle, then the ray bisects the angle. Explanations may vary. Sample: Refer to diagram in proof of Theorem 7-5, p. 400. It is given that $\frac{CD}{DB} = \frac{CA}{BA}$, and by the Side-Splitter Thm., $\frac{CD}{DB} = \frac{CA}{AF}$, so $BA = AF$. $\triangle ABF$ is isosceles by the Isos. Triangle Thm., so $\angle 3 \cong \angle 4$. $\angle 2 \cong \angle 4$ by the Alt. Int. Angles Thm., and $\angle 1 \cong \angle 3$ by the Corr. Angles Thm., so by substitution, $\angle 1 \cong \angle 2$, and therefore $\overline{AD}$ bisects $\angle CAB$.

47. **a.** 14

b. 11