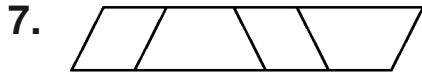


# Answers for Chapter 1, pp. 716-717 Extra Practice

1. 37, 42

3.  $8\frac{8}{5}$

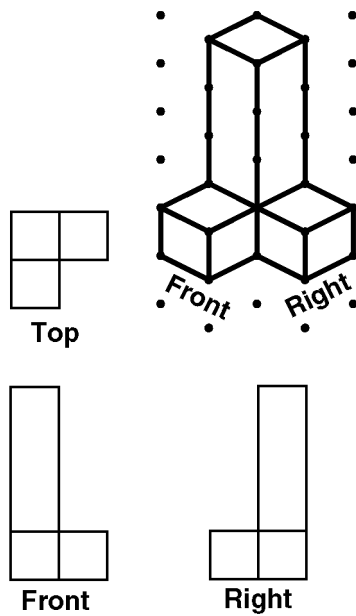
5. 0.0003, 0.00003



9. cube

11. cylinder

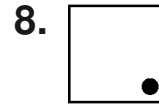
13.



2. 1.11111, 1.111111

4. 12,345, 123,456

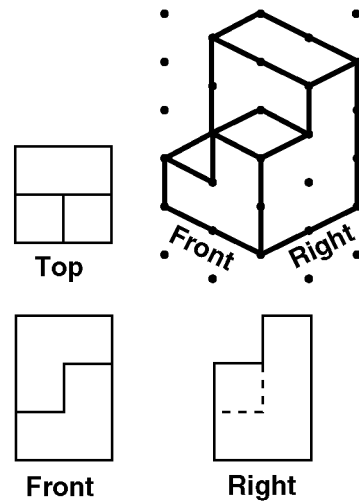
6. 36, 49



10. triangular prism

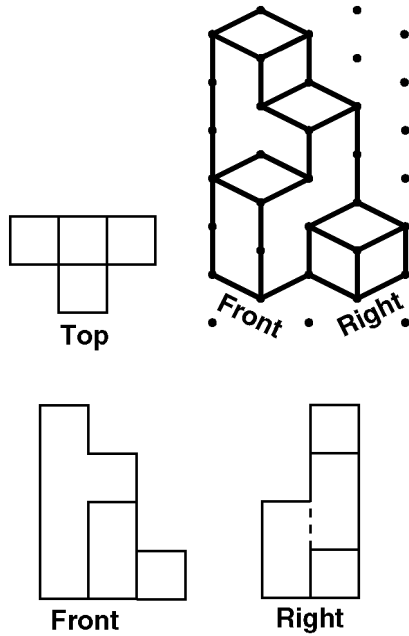
12. rectangular prism

14.

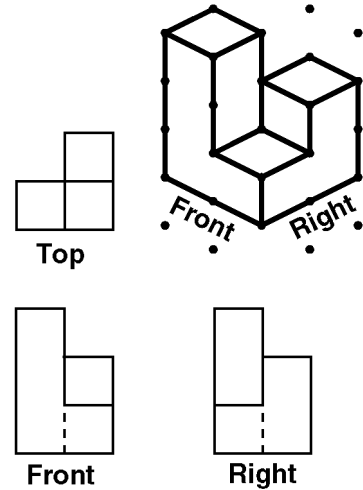


Answers for Chapter 1, pp. 716-717 Extra Practice (cont.)

15.



16.



17. A, C, G, I; D, G, F, I; A, B, G, H; A, D, C, F; B, C, H, I;  
C, F, D, G; A, B, H, I

18. true

19. false

20. true

21. true

22. false

23. true

24. true

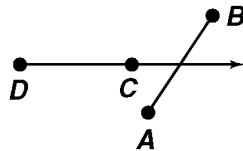
25. false

26. false

27. false

28. 10 sets

29. Sample:



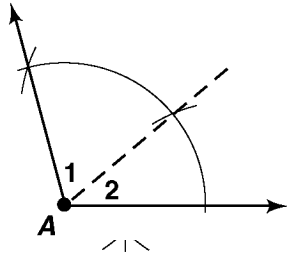
**Answers for Chapter 1, pp. 716-717 Extra Practice (cont.)**

30. 27

32. 6

34. 60,120

36. 31



31.  $\overline{CG}, BCA$

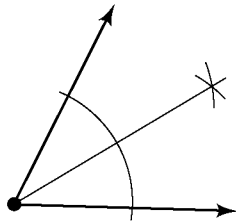
33. 8

35. 40

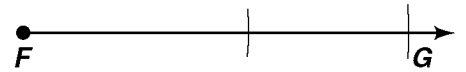
37. 7, 5, 12

39.

40.



41.



42. a. 1.4

b.  $(\frac{5}{2}, \frac{1}{2})$

44. a. 19.1

b.  $(-\frac{1}{2}, 3)$

46. a. 9.5

b.  $(\frac{3}{2}, -\frac{1}{2})$

48. a. (13,6)

b. 13 mi

49. 42 in., 98 in.<sup>2</sup>

50. 10 cm, 5 cm<sup>2</sup>

51.  $3\pi$  m,  $\frac{9}{4}\pi$  m<sup>2</sup>

52.  $(12 + 2\pi)$  in.,  $(16 + 2\pi)$  in.

43. a. 7.3

b.  $(\frac{3}{2}, 3)$

45. a. 10.4

b.  $(-\frac{13}{2}, -6)$

47. a. 13.9

b.  $(\frac{1}{2}, \frac{3}{2})$

## Answers for Chapter 2, pp. 718-719 Extra Practice

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- 1.** Hyp: You can predict the future.  
Concl: You can control the future.
- 2.** Hyp: Dan is nearsighted.  
Concl: Dan needs glasses.
- 3.** Hyp: Lines  $k$  and  $m$  are skew.  
Concl: Lines  $k$  and  $m$  are not perpendicular.
- 4.** If you can control the future, then you can predict the future.  
If Dan needs glasses, then Dan is nearsighted.  
If lines  $k$  and  $m$  are not perpendicular, then lines  $k$  and  $m$  are skew.
- 5.** If a number is one, then it is the smallest positive square.  
If a number is the smallest positive square, then it is one.  
A number is one if and only if it is the smallest positive square.
- 6.** If a figure is a rectangle, then it has four sides.  
If a figure has four sides, then it is a rectangle.
- 7.** If a square has an area of  $100 \text{ m}^2$ , then it has sides that measure 10 m.  
If a square has sides that measure 10 m, then it has an area of  $100 \text{ m}^2$ .  
A square has an area of  $100 \text{ m}^2$  if and only if it has sides that measure 10 m.
- 8.** If two numbers add up to be less than 12, then their product is less than 37.  
If two numbers have a product that is less than 37, then they add up to be less than 12.
- 9.** If three points are on the same line, then they are collinear.  
If three points are collinear, then they are on the same line.  
Three points are collinear if and only if they are on the same line.

## Answers for Chapter 2, pp. 718-719 Extra Practice (cont.)

---

10. No; the real number must be an integer.
11. yes
12. No; two skew lines are a counterexample.
13. yes
14. If lines  $m$  and  $n$  are skew, then lines  $m$  and  $n$  do not intersect; true  
If lines  $m$  and  $n$  do not intersect, then lines  $m$  and  $n$  are skew; false
15. If a person can be president of the United States, then the person is a citizen of the United States; true  
If a person is a citizen of the United States, then the person can be president of the United States; false
16. Jorge can't buy a new car.
17. Shauna will gain a promotion.
18. Linda's band will win \$500.
19. Brendan will be selected for the chorus.
20. If you enjoy all foods, then you eat bread; Law of Syllogism.
21. You will have a nightmare; Law of Detachment.
22. Catherine will get a speeding ticket; both laws.
23. If Carlos works 15 hours this week, then he can afford the video game that he wants; Law of Syllogism.
24. **b.** Mult. Prop. of =, Distr. Prop.  
**c.** Mult. Prop. of =  
**d.**  $4c - a = 4b$   
**e.** Symm. Prop. of =

**Answers for Chapter 2, pp. 718-719 Extra Practice (cont.)**

**25.** The two angles formed by the bisector have equal measures,  
so

$$4x + 2 = 6x - 10.$$

$$4x + 12 = 6x \qquad \text{Add. Prop. of =}$$

$$12 = 2x \qquad \text{Subt. Prop. of =}$$

$$6 = x \qquad \text{Div. Prop. of =}$$

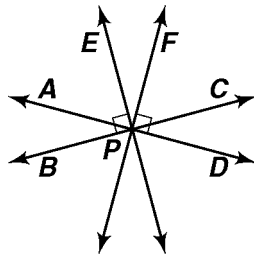
**26.** 24

**27.** 15

**28.** 25

**29.** 2 and 3 are vert.  $\sphericalangle$ s, so 2 E 3 by the Vert.  $\sphericalangle$ s Thm. 1 and 2 are compl. and 3 and 4 are compl. (Given), so 1 E 4 by the Cong. Complements Thm. From the diagram, 5 and 1 are suppl. and 4 and 6 are suppl. Therefore 5 E 6 by the Cong. Supplements Thm.

**30.** Counterexample:



## Answers for Chapter 3, pp. 720-721 Extra Practice

---

1.  $m \angle 1 = 134$ ; Same-Side Int.  $\sphericalangle$  Thm.  
 $m \angle 2 = 46$ ; Alt. Int. Thm.
2.  $m \angle 1 = 125$ ; Corr.  $\sphericalangle$  Post.  
 $m \angle 2 = 55$ ; Same-Side Int.  $\sphericalangle$  Thm.
3.  $m \angle 1 = 58$ ; Alt. Int. Thm.  
 $m \angle 2 = 122$ ; Same-Side Int.  $\sphericalangle$  Thm.
4.  $m \angle 1 = 64$ ; Alt. Int. Thm.  
 $m \angle 2 = 116$ ; Same-Side Int.  $\sphericalangle$  Thm.
5.
  - a. Vert.  $\sphericalangle$  Thm.
  - b. Same-Side Int.  $\sphericalangle$  Thm.
  - c. Same-Side Int.  $\sphericalangle$  Thm.
  - d. E Supplements Thm.
  - e. Trans. Prop. of E
  - f. Vert.  $\sphericalangle$  Thm.
  - g. Trans. Prop. of  $\cong$
6. none
7.  $r \parallel s$ , Conv. of Corr.  $\sphericalangle$  Post.
8.  $c \parallel d$ , Conv. of Same-Side Interior  $\sphericalangle$  Thm.
9. none
10.  $r \parallel s$ , Vert. Thm. and Conv. of Same-Side Int.  $\sphericalangle$  Thm.
11. none
12. none
13.  $c \parallel d$ , Conv. of Alt. Int. Thm.

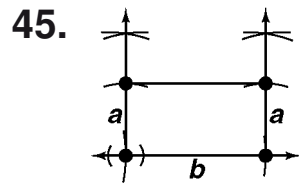
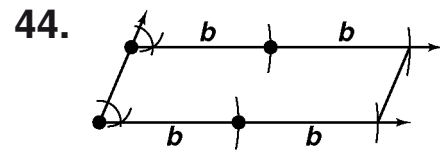
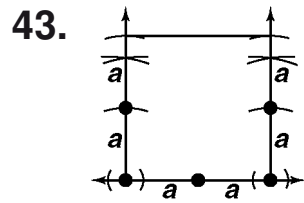
### Answers for Chapter 3, pp. 720-721 Extra Practice (cont.)

14.  $a \perp \ell$  and  $a \parallel b$  means that  $\ell \perp b$  since a line  $\perp$  to one of two  $\parallel$  lines is  $\perp$  to the other (Thm. 3-11).  $\ell \perp b$  and  $\ell \parallel m$  means that  $b \perp m$  for the same reason.
15. obtuse; scalene                      16. obtuse; isosceles
17. isosceles; acute                      18. right; scalene
19.  $\overleftrightarrow{BC} \parallel \overleftrightarrow{DF}$ ; by the Ext. Thm,  $m\angle BCD = a + b$  and  $m\angle CDF = a + b$ . Thus,  $m\angle BCD = m\angle CDF$  by the Trans. Prop. of  $=$ .  $\overleftrightarrow{BC} \parallel \overleftrightarrow{DF}$  by the Converse of the Alt. Int.  $\angle$  Thm.
20.  $x = 25$ ;  $y = 19$                       21. 100
22. 65                                          23.  $x = 110$ ;  $y = 102$ ;  $z = 82$
24. 55, 55                                      25. 122, 122, 122, 122, 116, 116
26.  $y - 2 = -\frac{5}{2}(x - 4)$  or  $y + 3 = -\frac{5}{2}(x - 6)$
27.  $y + 1 = (x + 1)$  or  $y - 1 = (x - 1)$
28.  $y + 5 = -1(x - 3)$  or  $y - 3 = -1(x + 5)$
29.  $y = -\frac{1}{5}(x - 5)$  or  $y - 2 = -\frac{1}{5}(x + 5)$
30.  $y = \frac{6}{5}x + \frac{23}{5}$                               31.  $y = -\frac{12}{7}x + \frac{4}{7}$
32.  $y = x + 2$                                 33.  $y = -\frac{1}{5}x + 1$
34.  $\parallel$ ; same slope
35. neither; not same slope and  $m_1 \cdot m_2 \neq -1$
36. perp.;  $m_1 \cdot m_2 = -1$
37. perp.;  $m_1 \cdot m_2 = -1$
38. neither                                      39. perpendicular
40. parallel                                      41. perpendicular



Answers for Chapter 3, pp. 720-721 Extra Practice (cont.)

42. No; the slopes of the lines are equal and the y-intercepts are different.



## Answers for Chapter 4, pp. 722-723 Extra Practice (cont.)

1.  $G$
2.  $\overline{SA}$
3.  $T$
4.  $\overline{RE}$
5.  $\triangle TAS$
6.  $\overline{TS}$
7.  $\triangle ATS$
8.  $A$
9. Yes; corr. sides and corr.  $\sphericalangle$ s are  $\cong$ .
10. No; the only known corr. E part is  $\overline{UV}$ .
11. Yes; corr. sides and corr. are E.
12. Yes; corr. sides and corr. are E.
13.  $\overline{TE} \cong \overline{S}$ ,  $\overline{YE} \cong \overline{W}$  and included sides  $\overline{TY} \cong \overline{SW}$ ; ASA.
14.  $\overline{EA} \cong \overline{PL}$ ,  $\overline{AL} \cong \overline{LA}$ , and included  $\sphericalangle EAL \cong \sphericalangle PLA$ ; SAS.
15. not possible
16.  $\overline{CN} \cong \overline{AO}$ ,  $\overline{NA} \cong \overline{OC}$ ,  $\overline{AC} \cong \overline{CA}$ ; SSS
17.  $\overline{ZP}$  bisects  $\overline{XY}$  means that  $\overline{XM} \cong \overline{YM}$ . It is given that  $\overline{PX} \cong \overline{PY}$ , and  $\overline{PM} \cong \overline{PM}$  by the Refl. Prop. of E. Thus,  $\triangle PXM \cong \triangle PYM$  by SSS and  $\overline{XP} \cong \overline{YP}$  by Def. of E.  $\overline{PZ} \cong \overline{PZ}$  by the Refl. Prop. of E, so  $\triangle PXZ \cong \triangle PYZ$  by SAS.
18. It is given that  $m \sphericalangle 1 = m \sphericalangle 2$  and  $m \sphericalangle 3 = m \sphericalangle 4$ . By the Add. Post.,  $m \sphericalangle DPA = m \sphericalangle CPB$ . Since  $P$  is the midpt. of  $\overline{AB}$ ,  $\overline{PA} \cong \overline{PB}$ . It is given that  $\overline{PD} \cong \overline{PC}$ , so  $\triangle ADP \cong \triangle BCP$  by SAS.
19. 1  $\cong$  2 is given.  $\triangle ABP \cong \triangle DCP$  by the E Suppls. Thm.  
3  $\cong$  4 and  $\overline{AP} \cong \overline{DP}$  are given.  $\triangle ABP \cong \triangle DCP$  by AAS.

**Answers for Chapter 4, pp. 722-723 Extra Practice (cont.)**

20.  $\overline{MP} \parallel \overline{NS}$  and  $\overline{RS} \parallel \overline{PQ}$  mean that  $1 \cong 4$  and  $2 \cong 3$ , respectively, by the Alt. Int.  $\sphericalangle$  Thm. It is given that  $MR = NQ$ , so  $MR + RQ = NQ + RQ$ , or  $MQ = NR$ , by the Add. Prop. of  $=$ . Therefore,  $\triangle MQP \cong \triangle NRS$  by ASA.
21.  $\overleftrightarrow{OL} \parallel \overleftrightarrow{MN}$ , so  $\angle OLN = \angle MNL$ .  $\overline{LN} \cong \overline{LN}$  by the Reflexive Prop. of  $\cong$ . Since  $\overline{LO} \cong \overline{MN}$ ,  $\triangle MLN \cong \triangle ONL$  by SAS, and  $MLN = ONL$  by CPCTC.
22.  $\overline{OS} \cong \overline{OS}$  by the Reflexive Prop. of  $\cong$ . Since  $\overline{TE} \cong \overline{E}$  and  $\overline{TSO} \cong \overline{EOS}$ ,  $\triangle TSO \cong \triangle EOS$  by AAS, and  $\overline{TO} \cong \overline{ES}$  by CPCTC.
23.  $\overline{BI} \cong \overline{BI}$  by the Reflexive Prop. of  $\cong$ . Since  $\overline{MBI} = \overline{RIB}$  and  $\overline{MIB} \cong \overline{RBI}$ ,  $\triangle MBI \cong \triangle RIB$  by ASA, and  $\overline{MB} \cong \overline{RI}$  by CPCTC.
24.  $1 \cong 2$ ,  $3 \cong 4$  (both given), and  $\overline{SQ} \cong \overline{SQ}$  (Refl. Prop. of  $\cong$ ) mean that  $\triangle PQS \cong \triangle RQS$  by AAS, and  $\overline{PQ} \cong \overline{RQ}$  by CPCTC. Point  $M$  is the midpoint of  $\overline{PR}$ , so  $\overline{PM} \cong \overline{RM}$ . Also,  $\overline{QM} \cong \overline{QM}$  by the Reflexive Prop. of  $\cong$ , so  $\triangle PQM \cong \triangle RQM$  by SSS.  $\angle PMQ \cong \angle RMQ$  by CPCTC.
25.  $1 \cong 2$ , so  $\triangle APO \cong \triangle BQO$  because suppl. of  $\cong$  are  $\cong$ .  $\overline{PO} = \overline{QO}$  (Given) and  $\angle AOP \cong \angle BOQ$  as vert.  $\sphericalangle$ s, so  $\triangle AOP \cong \triangle BOQ$  by ASA.  $\overline{AO} \cong \overline{BO}$  by CPCTC.
26. 65
27.  $x = 57$ ;  $y = 66$
28.  $x = 45$ ;  $y = 90$ ;  $z = 45$
29.  $\overline{PX} \cong \overline{PY}$  (Given) means that  $1 \cong 2$  by the Isos.  $\triangle$  Thm.  $3 \cong 4$  by the  $\cong$  Suppl. Thm.  $5 \cong 6$  (Given), so  $\triangle PXA \cong \triangle PYB$  by ASA.  $\overline{PA} \cong \overline{PB}$  by CPCTC and  $\triangle PAB$  is isos. by def. of isos.

**Answers for Chapter 4, pp. 722-723 Extra Practice (cont.)**

- 30.**  $\overline{AP} \cong \overline{BP}$  and  $\overline{PC} \cong \overline{PD}$  (both given).  $\triangle APC \cong \triangle BPD$  as vert., so  $\triangle APC \cong \triangle BPD$  by SAS.  $\angle ACP \cong \angle BDP$  because CPCTC.  $\angle PCD \cong \angle PDC$  by the Isos.  $\triangle$  Thm.  $m \angle ACP + m \angle PCD = m \angle BDP + m \angle PDC$  by the Add. Prop. of  $=$ , so  $m \angle ACD = m \angle BDC$  by the Add. Post. and substitution.  $\overline{QD} \cong \overline{QC}$  by Conv. of the Isos.  $\triangle$  Thm., and  $\triangle QCD$  is isos. by def. of isos.  $\triangle$ .
- 31.**  $\triangle ARO \cong \triangle RFA$ ; HL                      **32.**  $\triangle RQM \cong \triangle QRS$ ; SSS
- 33.**  $\triangle AON \cong \triangle MOP$ ; AAS
- 34.** 1  $\cong$  2 (Given), so  $\overline{MC} \cong \overline{MD}$  by the Conv. of the Isos.  $\triangle$  Thm.  $\overline{AM} \cong \overline{BM}$  by the def. of midpt.  $\overline{MC} \perp \overline{AC}$  means that  $\triangle ACM$  is a rt.  $\triangle$  and  $\triangle ACM$  is a rt.  $\triangle$ .  $\overline{MD} \perp \overline{BD}$  means that  $\triangle BDM$  is a rt.  $\triangle$  and  $\triangle BDM$  is a rt.  $\triangle$ .  $\triangle ACM \cong \triangle BDM$  by HL.
- 35.**  $\overline{AP} \perp \overline{PQ}$  and  $\overline{BQ} \perp \overline{PQ}$  (both given) means  $\overline{AP} \parallel \overline{BQ}$  because two lines  $\perp$  to a third line are  $\parallel$ . 3  $\cong$  6 as alt. int.  $\angle$ . Likewise, 5  $\cong$  4.  $\triangle APQ \cong \triangle BQP$  (given), so  $\overline{AP} \cong \overline{BQ}$  because CPCTC.  $\triangle APX \cong \triangle QBX$  by ASA.  $\overline{AX} \cong \overline{QX}$  by CPCTC, and  $X$  is the midpt. of  $\overline{AQ}$  by def. of midpt.

## Answers for Chapter 5, pp. 724-725 Extra Practice

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1.  $\frac{25}{7}$

2. 32

3. 7

4. 10

5. 140 ft

6. 5

7. 7

8.  $\frac{5}{2}$

9.  $\frac{15}{2}$

10. It is given that each of  $A$ ,  $B$ , and  $C$  is equidistant from  $P$  and  $Q$ . By the Conv. of the  $\perp$  Bisector Thm.,  $A$ ,  $B$ , and  $C$  are on the same line, namely the  $\perp$  bisector of  $PQ$ .

11. Since  $X$  is on the bisector of  $BCN$  and the bisector of  $CBM$ ,  $X$  is equidistant from the sides  $\overrightarrow{BM}$ ,  $\overrightarrow{BC}$ , and  $\overrightarrow{CN}$  (Bisector Thm). Therefore  $X$  is equidistant from  $\overrightarrow{AM}$  (containing  $\overrightarrow{BM}$ ) and  $\overrightarrow{AN}$  (containing  $\overrightarrow{CN}$ ), the sides of  $A$ . By the Conv. of the Bisector Thm.,  $X$  is on the bisector of  $A$

12.  $y = \frac{10}{7}x - \frac{61}{14}$

13. (1,5)

14. (2,2)

15. (0,0)

16. (-6,-6)

17. bisector

18. median

19. altitude

20.  $\infty$  bisector

21. (3.5,5.1)

22. a. line  $k$

b. line  $m$

c. line  $\ell$

d. line  $n$

## Answers for Chapter 5, pp. 724-725 Extra Practice (cont.)

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- 23.** Check students' work. The  $\Delta$  should show three acute  $\sphericalangle$ . The construction should include bisectors of at least two of the. The final diagram should show an incircle (tangent to the three sides of the  $\Delta$ ).
- 24. a.** If two  $\sphericalangle$ s are not vert., then they are not E.  
**b.** If two  $\sphericalangle$ s are not  $\cong$ , then they are not vert.
- 25. a.** If figures are not similar, then their side lengths are not prop.  
**b.** If their side lengths are not prop., then figures are not similar.
- 26. a.** If a car is not blue, then it has doors.  
**b.** If a car has doors, then it is not blue.
- 27. a.** If a triangle is not scalene, then it is equiangular.  
**b.** If a triangle is equiangular, then it is not scalene.
- 28.**  $B$  is not an acute angle.
- 29.** Assume  $\Delta ABC$  is not a right  $\Delta$ .
- 30.** Assume points  $J$ ,  $K$ , and  $L$  are not collinear.
- 31.** Assume lines  $\ell$  and  $m$  are  $\parallel$ .
- 32.** Assume  $\square XYZV$  is not a square.
- 33.**  $\overline{RN}$ ,  $\overline{RS}$ ,  $\overline{NS}$                       **34.**  $\overline{JB}$ ,  $\overline{PB}$ ,  $\overline{PJ}$
- 35.**  $\overline{MQ}$ ,  $\overline{QD}$ ,  $\overline{MD}$                       **36.**  $\overline{CT}$ ,  $\overline{TA}$ ,  $\overline{CA}$
- 37.** No;  $2 + 3 \not> 5$ .                              **38.** Yes;  $9 + 11 > 15$ .
- 39.** No;  $8 + 9 \not> 18$ .

## Answers for Chapter 5, pp. 724-725 Extra Practice (cont.)

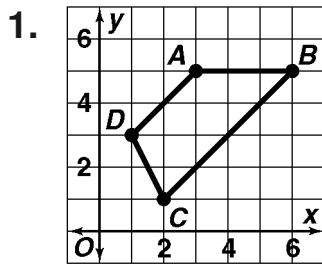
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40.  $\overline{PQ}, \overline{QR}, \overline{PR}$

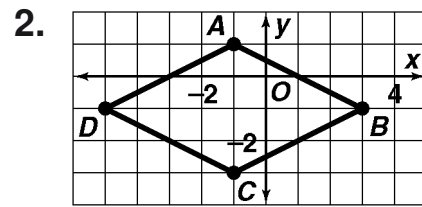
41.  $M, S, N$

42.  $9 < x < 25$

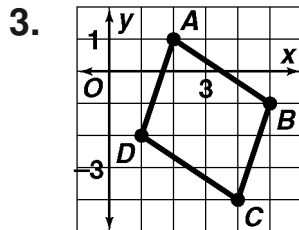
## Answers for Chapter 6, pp. 726-727 Extra Practice



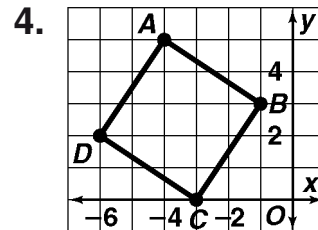
trapezoid



rhombus



parallelogram



square

5.  $x = 12; y = 84$

6.  $x = 30; y = 55$

7.  $x = 8; y = 25$

8.  $x = 1; y = 7$

9. Since  $PQRS$  is a  $\square$ , its opp. sides are  $\parallel$ , so  $\overline{PA} \parallel \overline{SB}$  and  $\overline{PS} \parallel \overline{QR}$ . Since  $QDCA$  is a  $\square$ ,  $\overline{AB} \parallel \overline{QR}$ . Thus,  $\overline{PS} \parallel \overline{AB}$  because two lines  $\parallel$  to the same line are  $\parallel$ .  $PABS$  is a  $\square$  by def. of  $\square$ , and  $AP = BS$  since opp. sides of a  $\square$  are  $\cong$ .

10. The diagonals of a  $\square$  bisect each other, so  $P$  is the midpt. of  $\overline{AC}$ .  $P$  and  $M$  are midpts. of two sides of  $\triangle ACD$  so, by the  $\Delta$  Midseg. Thm.,  $\overline{PM} \parallel \overline{AD}$ .

11. yes

12. yes

13. no

14. yes

15. Sample answer: Mark two  $\cong$  segments on each of the two  $\parallel$  lines. The two segments are opposite sides of a  $\square$ . Construct (draw) the diagonals of the  $\square$ . The diagonals intersect at their midpts., which is the desired point halfway between the  $\parallel$  lines.

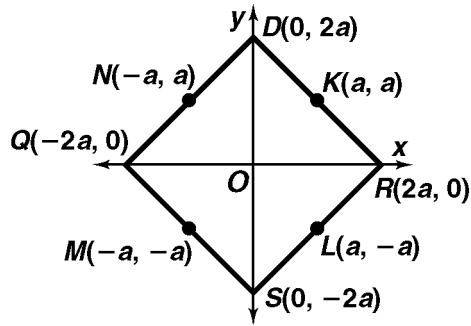


**Answers for Chapter 6, pp. 726-727 Extra Practice (cont.)**

- 16.**  $ABCD$  is a  $\square$  (given), so  $\overline{AB} \parallel \overline{DC}$  and  $\overline{AB} \cong \overline{DC}$ .  $\angle BAX \cong \angle DCY$  by the Alt. Int.  $\angle$  Thm.  $\angle AXB$  and  $\angle CYD$  are rt.  $\angle$ s and therefore  $\triangle AXB \cong \triangle CYD$  by AAS and  $\overline{BX} \cong \overline{DY}$  by CPCTC. Since  $\overline{BX} \perp \overline{AC}$  and  $\overline{DY} \perp \overline{AC}$  (given),  $\overline{BX} \parallel \overline{DY}$ .  $BXDY$  has a pair of sides  $\parallel$  and  $\cong$ , so  $BXDY$  is a  $\square$ .
- 17.** square;  $m \angle 1 = 45$ ,  $m \angle 2 = 45$
- 18.** rhombus;  $m \angle 1 = 50$ ,  $m \angle 2 = 90$ ,  $m \angle 3 = 40$ ,  $m \angle 4 = 40$
- 19.** ;  $m \angle 1 = 45$ ,  $m \angle 2 = 45$ ,  $m \angle 3 = 80$ ,  $m \angle 4 = 55$
- 20.** rectangle;  $m \angle 1 = 116$ ,  $m \angle 2 = 64$ ,  $m \angle 3 = 32$ ,  $m \angle 4 = 58$
- 21.** By the Conv. of the Isos.  $\triangle$  Thm. and given that  $PA = PB$ , it follows that  $PD = PA = PB = PC$ . Thus, the diagonals of  $ABCD$  bisect each other (so  $ABCD$  is a  $\square$ ) and are  $\perp$  (by the Seg. Add. Post.), so  $ABCD$  is a rectangle.
- 22.**  $\angle 1$  and  $\angle 2$  are compl. The diags. of rhombus  $ABCD$  are  $\perp$  and bisect each other, so the 4 small  $\triangle$ s are  $\cong$  rt.  $\triangle$ s.  $\angle 1$  and  $\angle 2$  are compl., and  $\triangle CBK \cong \triangle DAK$ , so  $\angle 1$  and  $\angle 2$  are compl.
- 23.**  $m \angle 1 = 110$ ,  $m \angle 2 = 25$                       **24.**  $m \angle 1 = 90$ ,  $m \angle 2 = 23$
- 25.**  $m \angle 1 = 110$ ,  $m \angle 2 = 70$                       **26.**  $m \angle 1 = 70$ ,  $m \angle 2 = 70$
- 27.**  $ABCD$  is an isos. trap. except when  $m \angle APB = 90$ , and in that case it is a square.
- 28.**  $D(0, b)$ ;  $S(a, 0)$                       **29.**  $D(0, b)$ ;  $S(-a, 0)$
- 30.**  $D(-c, 0)$ ;  $S(0, -b)$                       **31.**  $D(0, 2a)$ ;  $S(0, -2a)$

**Answers for Chapter 6, pp. 726-727 Extra Practice (cont.)**

- 32.** Given: Square  $\overline{DRSQ}$  with  $K, L, M, N$  midpts. of  $\overline{DR}, \overline{RS}, \overline{SQ}$ , and  $\overline{QD}$ , respectively. Prove:  $KLMN$  is a square.



$K(a, a), L(a, -a), M(-a, -a),$  and  $N(-a, a)$  are midpts. of the sides of the square.  $KL = LM = MN = NK = 2a$ . The slopes of  $\overline{KL}$  and  $\overline{MN}$  are undefined. The slopes of  $\overline{LM}$  and  $\overline{NK}$  are 0, so adj. sides are  $\perp$  to each other. Since all  $\sphericalangle$ s are rt.  $\sphericalangle$ s, the quad. is a rectangle. A rectangle with all E sides is a square.

- 33.** The line through  $R(2a, 0)$  and  $M(-a, b)$  is  $y = \frac{b}{-3a}(x - 2a)$ .  
 The line through  $Q(-2a, 0)$  and  $N(a, b)$  is  $y = \frac{b}{3a}(x + 2a)$ .  
 For each line, when  $x = 0, y = \frac{2b}{3}$ , so the three medians all contain point  $H(0, \frac{2b}{3})$ .

## Answers for Chapter 7, pp. 728-729 Extra Practice

1. 10

2. 36

3. 2

4. 6

5.  $\frac{9}{2}$

6. 21

7.  $x = \frac{80}{3}; y = 6; z = \frac{16}{3}$

8.  $x = 3\sqrt{10}; y = 2\sqrt{10}$

9.  $x = 30; y = 4$

10.  $x = 12; y = 8$

11. No; sample sketch: a square and a rhombus

12. Yes;  $\triangle QCT \sim \triangle MCP$  by SAS $\sim$ .

13. Yes;  $\triangle XZY \sim \triangle EWN$  by AA $\sim$ .

14. no

15. Yes;  $\triangle ABC \sim \triangle EBD$  by AA $\sim$ .

16. Yes;  $\triangle XYZ \sim \triangle PRQ$  by SSS $\sim$ .

17. Yes;  $\triangle HJK \sim \triangle RST$  by SAS $\sim$ .

18.  $\triangle CAB \sim \triangle CED$  by SSS $\sim$ .  $\angle E$  as corres.  $\angle$ s of  $\sim \triangle$ s, so  $\overline{AB} \parallel \overline{ED}$  by the Conv. of the Alt. Int.  $\angle$  Thm.

19.  $x = \sqrt{5}; y = 2; z = 2\sqrt{5}$

20.  $x = \sqrt{70}; y = \sqrt{21}; z = \sqrt{30}$

21.  $x = 65; y = 60; z = 156$

22.  $x = 6; y = 2\sqrt{5}; z = 3\sqrt{5}$

23. Place  $\triangle ABC$  in the coordinate plane with  $A(-a, 0)$ ,  $B(b, 0)$ ,  $C(0, \sqrt{ab})$  (given), and  $D(0, 0)$ . Slope of  $\overleftrightarrow{AC} = \frac{\sqrt{ab}}{a}$ . Slope of  $\overleftrightarrow{BC} = \frac{\sqrt{ab}}{-b}$ . The product  $\frac{\sqrt{ab}}{a} \cdot \frac{\sqrt{ab}}{-b} = \frac{ab}{-ab} = -1$ , so  $\overleftrightarrow{AC} \perp \overleftrightarrow{BC}$ .

## Answers for Chapter 7, pp. 728-729 Extra Practice

24.  $\frac{60}{13}$

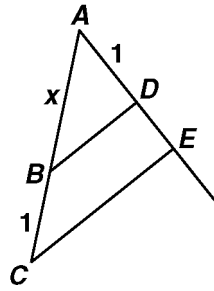
25.  $\frac{72}{5}$

26.  $\frac{117}{10}$

27. 20

28.  $\frac{56}{3}$

29.



Construct  $\overline{AC}$  with  $\overline{AB} = x$  and  $BC = 1$ . On another line from  $A$ , construct  $\overline{AD}$  of length 1. Construct a line through  $C \parallel$  to  $\overline{BD}$  and intersecting  $\overline{AD}$  in  $E$ . By the Side-Splitter Thm.,  $\frac{x}{1} = \frac{1}{DE}$ , so  $DE = \frac{1}{x}$ .

30. 4.5 mi

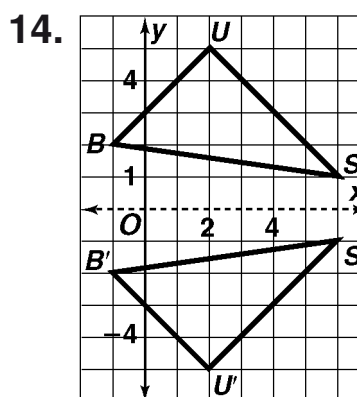
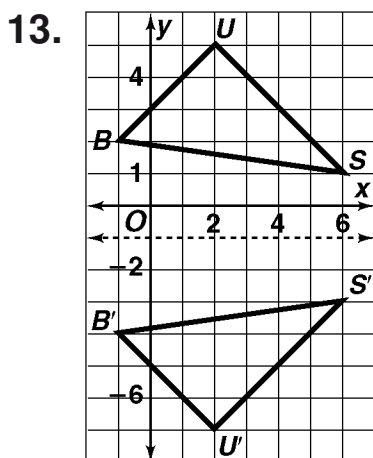
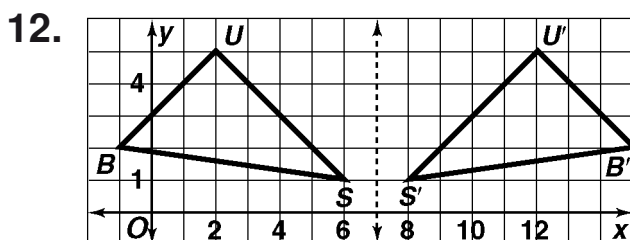
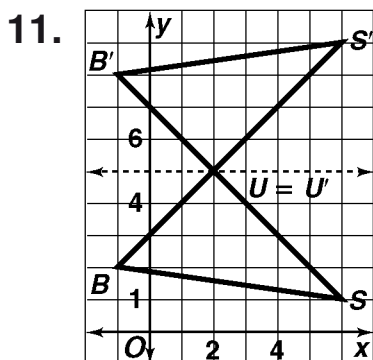
## Answers for Chapter 8, pp. 730-731 Extra Practice

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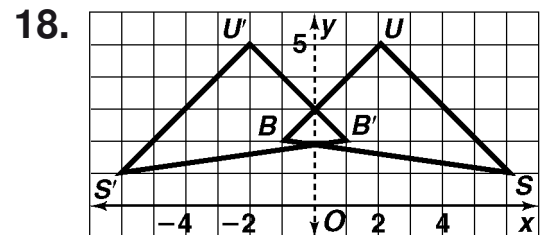
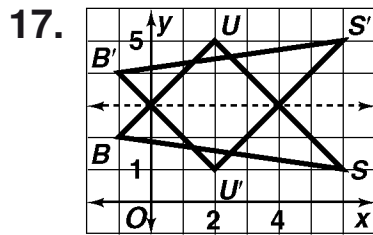
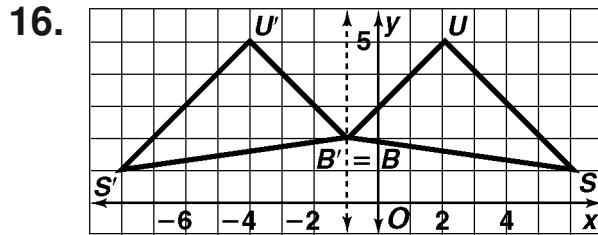
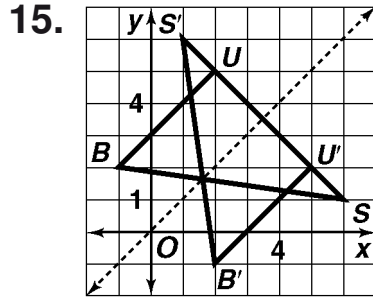
1. 15  
2.  $5\sqrt{3}$   
3.  $3\sqrt{5}$   
4.  $3\sqrt{2}$   
5. 188 ft.  
6.  $6\sqrt{2}$  cm,  $6\sqrt{2}$  cm  
7. 13 cm,  $13\sqrt{3}$   
8.  $8\sqrt{3}$  in., 16 in.  
9.  $\sqrt{2}$  units,  $\sqrt{2}$  units, 2 units  
10. 5.6  
11. 29  
12. 11.0  
13. 9.4  
14. 49  
15. 50  
16. 7.2  
17. 49  
18. No; sample: in the plan, change 100 ft to 114.5 ft  
19. about  $66.4^\circ$   
20. 53.2 ft  
21. 4.6 ft  
22. 653 ft  
23. 139 ft  
24. 78 ft  
25. 90 ft; 143 ft  
26. 2000 ft  
27. a.  $\langle -49, 142 \rangle, \langle 38, 47 \rangle$   
b.  $\langle -11, 189 \rangle$   
28. a.  $\langle -118, -55, 86, 110 \rangle$   
b.  $\langle -32, 55 \rangle$   
29. a.  $\langle -54, 72 \rangle, \langle -95, -33 \rangle$   
b.  $\langle -149, 39 \rangle$   
30. a.  $\langle -21, -56, 27, -64 \rangle$   
b.  $\langle 6, -120 \rangle$   
31.  $\langle 2, 11 \rangle$   
32.  $\langle 3, -6 \rangle$   
33.  $\langle 2, 13 \rangle$   
34.  $\langle 0, 0 \rangle$   
35. about 56.8 km; about  $14.3^\circ$  north of west

## Answers for Chapter 9, pp. 732-733 Extra Practice

1.  $E$
2.  $(x, y) \rightarrow (x - 2, y + 4)$
3.  $C$
4.  $(x, y) \rightarrow (x + 4, y - 2)$
5.  $G$
6.  $(x, y) \rightarrow (x - 8, y)$
7.  $A'(-5,9), B'(-3,3), C'(-1,10)$
8.  $E'(1,0), F'(7, -4), G'(5, -1)$
9.  $P'(-15, -11), Q'(-11, -6), R'(-4,1)$
10. Sample:  $(x, y) \rightarrow (x, y + 4), (x, y) \rightarrow (x - 4, y)$

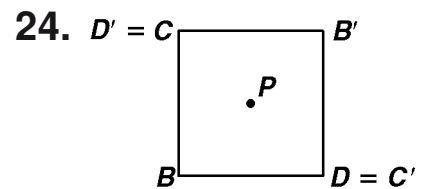
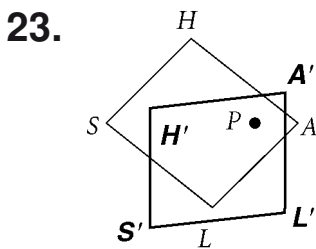
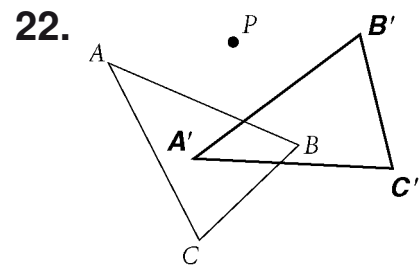
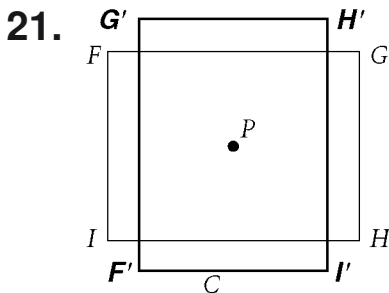


# Answers for Chapter 9, pp. 732-733 Extra Practice (cont.)



19. A and I

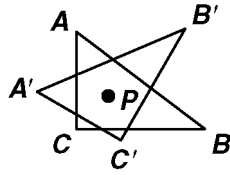
20. rectangle



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Answers for Chapter 9, pp. 732-733 Extra Practice (cont.)

25.



26.  $40^\circ$

27. line, rotation, point

28. line

29. line

30. line, rotation, point

31. a. isosceles

b. equilateral

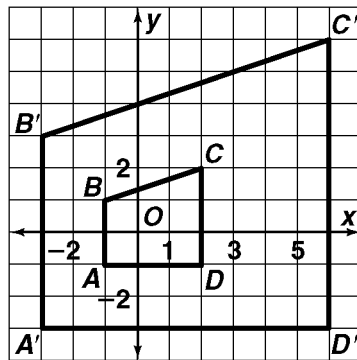
32. rotation

33. dilation

34. translation

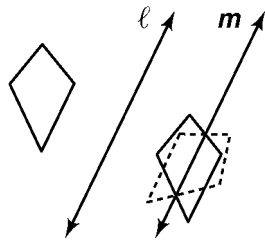
35. glide reflection

36.

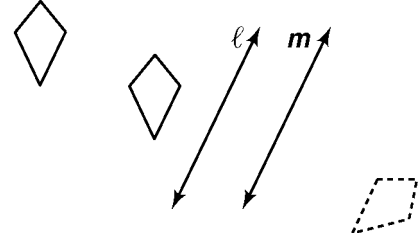


37. Translate the polygon using  $(x, y) \rightarrow (x - 2, y - 5)$ . Then dilate with center  $(0,0)$  and scale factor 3. Then translate using  $(x, y) \rightarrow (x + 2, y + 5)$

38. Reflect over  $\ell$ , then over  $m$ .

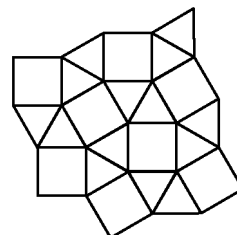


Reflect over  $m$ , then over  $\ell$ .



39. all of them.

40.





## Answers for Chapter 10, pp. 734-735 Extra Practice

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1. 15 ft;  $10.825 \text{ ft}^2$
2. 16 m;  $12 \text{ m}^2$
3. 50 ft;  $143 \text{ ft}^2$
4. 47 m;  $102 \text{ m}^2$
5. 60 yd;  $120 \text{ yd}^2$
6. perimeter not possible as slanted sides could be any length;  
 $270 \text{ in.}^2$
7.  $72 \text{ cm}^2$
8.  $15 \text{ in.}^2$
9.  $\frac{25}{4} \sqrt{3} \text{ mm}^2$
10.  $32\sqrt{3} \text{ ft}^2$
11.  $3500 \text{ ft}^2$
12.  $2.625 \text{ in.}^2$
13.  $\frac{73\sqrt{3}}{128} \text{ in.}^2$
14.  $210 \text{ ft}^2$
15. 5:8; 25:64
16. 3:4; 9:16
17. 5:16; 25:256
18.  $560 \text{ in.}^2$
19. 48.4 cm
20.  $30.1 \text{ ft}^2$
21.  $78.0 \text{ in.}^2$
22.  $43.2 \text{ cm}^2$
23.  $20 \text{ m}^2$
24.  $31.2 \text{ ft}^2$
25.  $70.7 \text{ ft}^2$
26. a.  $6\pi \text{ cm}$
27. a.  $20\pi \text{ ft}$
- b.  $2\pi \text{ cm}$
- b.  $\frac{5}{3}\pi \text{ ft}$
28. a.  $18\pi \text{ cm}$
29. a.  $10\pi \text{ in.}$
- b.  $\frac{9}{2}\pi \text{ cm}$
- b.  $\frac{25}{4}\pi \text{ in.}$
30. 482
31.  $\frac{49}{3}\pi \text{ ft}^2$
32.  $(12\pi - 9\sqrt{3}) \text{ in.}^2$
33.  $\frac{81}{8}\pi \text{ cm}^2$
34.  $(4\pi - 8) \text{ m}^2$
35.  $26 \text{ in.}^2$

## Answers for Chapter 10, pp. 734-735 Extra Practice (cont.)

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36.  $\frac{1}{4}$

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

38.  $1 - \frac{\pi}{4}$

39.  $\frac{7}{24}$

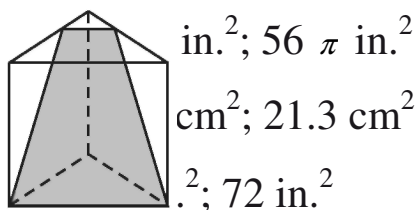
40.  $\frac{11}{36}$

41.  $1 - \frac{25}{81\pi}$

## Answers for Chapter 11, pp. 736-737 Extra Practice

1. equilateral  $\triangle$ ;  $7 + 10 = 15 + 2$
2. rectangle;  $7 + 10 = 15 + 2$
3. equilateral  $\triangle$ ;  $7 + 7 = 12 + 2$
4. regular hexagon;  $7 + 10 = 15 + 2$
- 5.

6.  $84 \text{ ft}^2$ ;  $108 \text{ ft}^2$



$\text{in.}^2$ ;  $56 \pi \text{ in.}^2$   
 $\text{cm}^2$ ;  $21.3 \text{ cm}^2$   
 $\text{in.}^2$ ;  $72 \text{ in.}^2$

7.  $28 \pi \text{ cm}^2$ ;  $36 \pi \text{ cm}^2$

9.  $108\sqrt{3} \text{ in.}^2$ ;  $144\sqrt{3} \text{ in.}^2$

11.  $339.3 \text{ cm}^2$ ;  $439.8 \text{ cm}^2$

13.  $37.5 \text{ cm}^2$ ;  $47.9 \text{ cm}^2$

15.  $51.7 \text{ cm}^2$ ;  $71.0 \text{ cm}^2$

14.  $55.0 \text{ ft}^2$ ;  $83.2 \text{ ft}^2$

16.  $16 \text{ mm}^3$

17.  $175 \text{ mm}^3$

18.  $15 \pi \text{ m}^3$

19.  $45 \pi \text{ in.}^3$

20.  $540 \text{ cm}^3$

21.  $400 \text{ in.}^3$

22.  $347.6 \text{ m}^3$

23.  $49.3 \text{ in.}^3$

24.  $5670 \text{ ft}$

25.  $486.0 \text{ cm}^3$

26.  $5.7 \text{ in.}^3$

27.  $\frac{500\pi}{3} \text{ cm}^3$ ,  $524 \text{ cm}^3$ ;  $100\pi \text{ cm}^2$ ,  $314 \text{ cm}^2$

28.  $36 \pi \text{ ft}^3$ ,  $113 \text{ ft}^3$ ;  $36 \pi \text{ ft}^2$ ,  $113 \text{ ft}^2$

29.  $\frac{256\pi}{3} \text{ in.}^3$ ,  $268 \text{ in.}^3$ ;  $64 \pi \text{ in.}^2$ ,  $201 \text{ in.}^2$

30.  $\frac{4\pi}{3} \text{ ft}^3$ ,  $4 \text{ ft}^3$ ;  $4 \pi \text{ ft}^2$ ,  $13 \text{ ft}^2$

## Answers for Chapter 11, pp. 736-737 Extra Practice (cont.)

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31.  $\frac{\pi}{6} \text{ in.}^3$ ,  $1 \text{ in.}^3$ ;  $\pi \text{ in.}^2$ ,  $3 \text{ in.}^2$
32.  $\frac{243\pi}{2} \text{ m}^3$ ,  $382 \text{ m}^3$ ;  $81 \pi \text{ m}^2$ ,  $254 \text{ m}^2$
33.  $\frac{256\pi}{3} \text{ m}^3$
34.  $\frac{32\pi}{3} \text{ in.}^3$
35.  $\frac{343\pi}{6} \text{ ft}^3$
36.  $9.62 \text{ ft}^2$ ;  $2.81 \text{ ft}^3$
37. 4:9; 8:27
38. 5:8; 125:512
39. 3:4; 9:16
40. S.A. is multiplied by  $\frac{25}{16}$ . Volume is multiplied by  $\frac{125}{64}$ .
41.  $\left(\frac{V_1}{V_2}\right)^2 = \left(\frac{A_1}{A_2}\right)^3$

## Answers for Chapter 12, pp. 738-739 Extra Practice

1. 65

2. 10

3. 6

4.  $2\sqrt{3}$

5. Tangents to a  $\odot$  from a point outside the  $\odot$  are E, so  $AS = AP$ ,  $BP = BQ$ ,  $CQ = CR$ , and  $DR = DS$ . By the Segment Add. Post. and various Props. or =,

$$AB + DC =$$

$$AP + BP + DR + CR =$$

$$AS + BQ + DS + CQ =$$

$$BQ + CQ + AS + DS =$$

$$BC + AD$$

6. 14.8

7. 5.2

8. 5.3

9. 20

10.  $a = 154$ ;  $b = 76$

11.  $a = 38$ ;  $b = 52$ ;  $c = 104$ ;  $d = 90$

12.  $a = 105$ ;  $b = 100$

13.  $a = 55$ ;  $b = 72$ ;  $c = 178$ ;  $d = 89$

14. Yes. Each side of the polygon is a chord of the circle, and the  $\infty$  bis. of any chord contains the center of the circle.

15. 1.82 units

16.  $\angle A \cong \angle D$  since they both intercept  $BC$ .  $\angle APB \cong \angle DPC$  since they are vertical.  $\triangle APB \sim \triangle DPC$  by AA $\sim$ .

17.  $x = 193$ ;  $y = 60.5$

18.  $x = 5.6$

19.  $x \approx 10.4$

20.  $x = 70$

21.  $x = 112.5$ ;  $y = 67.5$

22.  $x = 11.5$

23.  $x = 42.5$

24.  $x \approx 5.6$ ;  $y \approx 11.9$

Answers for Chapter 12, pp. 738-739 Extra Practice (cont.)

25. 90; 150

26. 18 ft

27.  $x^2 + y^2 = 16$

28.  $x^2 + (y - 5)^2 = 9$

29.  $(x - 9)^2 + (y + 3)^2 = 49$

30.  $(x + 4)^2 + y^2 = 37$

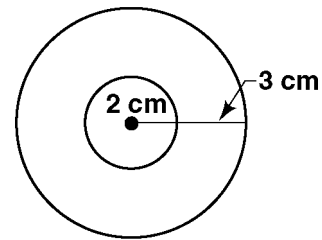
31.  $(x + 6)^2 + (y + 2)^2 = 13$

32.  $(x + 1)^2 + (y + 3)^2 = 9$

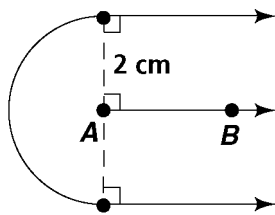
33. a.  $(x - 113)^2 + (y - 215)^2 = 85^2$

b.  $(x - 113)^2 + (y - 215)^2 = 170^2$

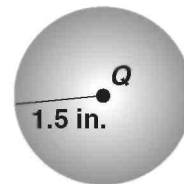
34. a circle of radius 5 cm, concentric with the orig. circle



35. two rays  $\parallel$  to and 2 cm from  $\overrightarrow{AB}$ , and the semicircle of radius 2 with center  $A$ , opp. pt.  $B$



36. a sphere of radius 1.5 in., and center  $Q$



37.

