

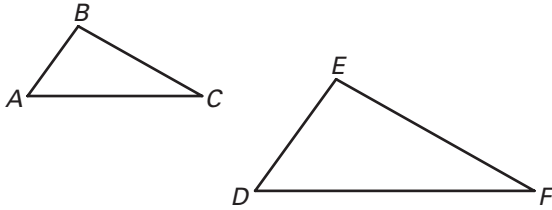
LESSON 6.3

Practice A

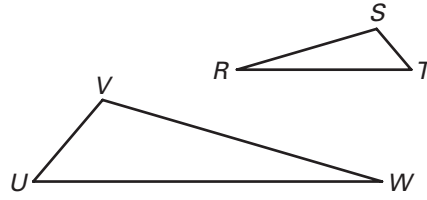
For use with pages 387–395

List all pairs of congruent angles for the figures. Then write the ratios of the corresponding sides in a statement of proportionality.

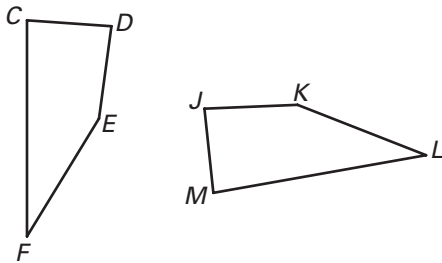
1. $\triangle ABC \sim \triangle DEF$



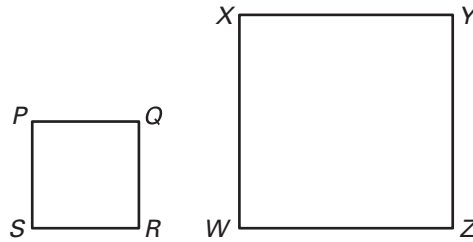
2. $\triangle RST \sim \triangle WVU$



3. $CDEF \sim MJKL$

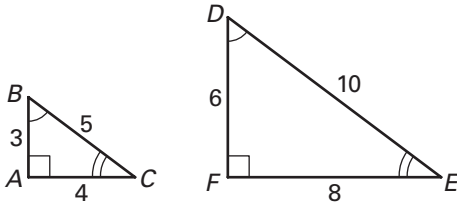


4. $PQRS \sim ZWXY$

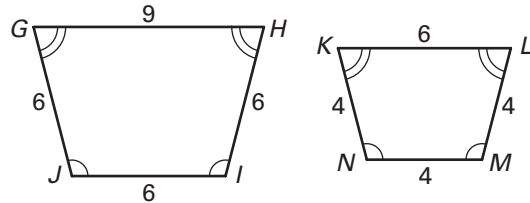


Determine whether the polygons are similar. If they are, write a similarity statement and find the scale factor.

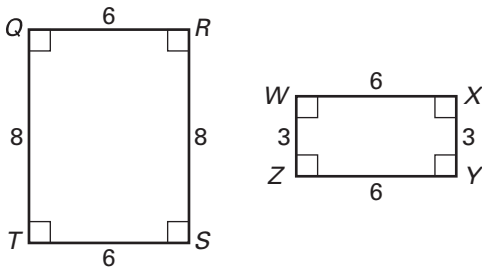
5.



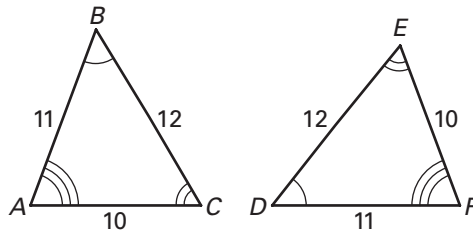
6.



7.



8.



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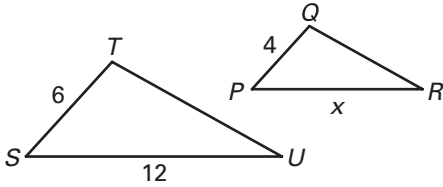
LESSON 6.3

Practice A *continued*

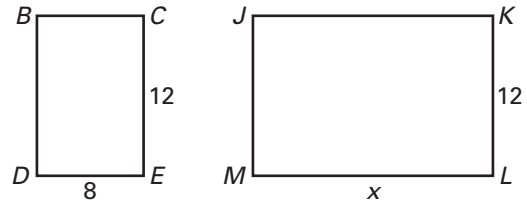
For use with pages 387–395

The polygons are similar as indicated. Find the value of x .

9. $\triangle STU \sim \triangle PQR$

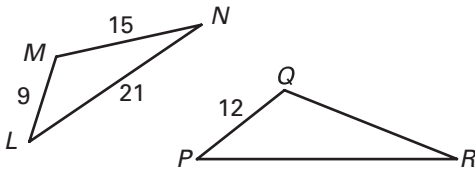


10. $BCED \sim KLMJ$

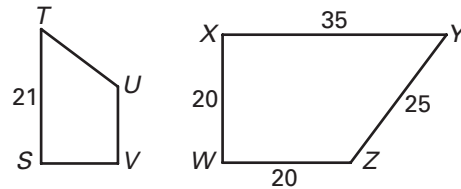


Use the similarity statement to find the scale factor of the polygon on the left to the polygon on the right. Then find the perimeter of each polygon.

11. $\triangle LMN \sim \triangle PQR$

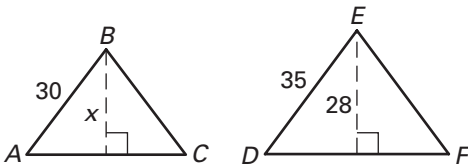


12. $STUV \sim XYZW$

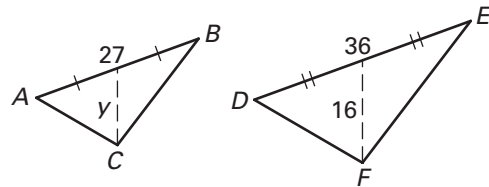


In the figure, $\triangle ABC \sim \triangle DEF$. Indicate what type of special segments are shown as dashed lines. Then find the value of the variable.

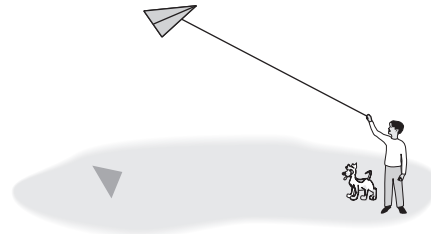
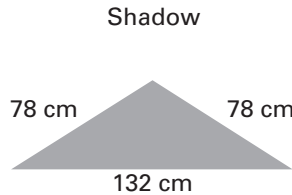
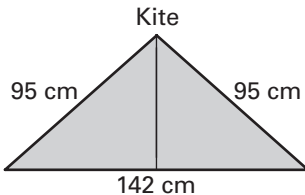
13.



14.



15. **Kites** You are flying a kite on a sunny day. The kite has the side lengths shown in the figure below at the left. The kite's shadow has the side lengths shown in the figure below at the right.



Is the shadow similar to the kite? *Explain* your reasoning.

Lesson 6.2, continued

19. 12.5 mi 20. 16 mi 21. 1 in.: 8 mi
 22. 1 cm: 4 mi 23. 1 in.: 50 ft 24. 1 in.: 80 km
 25. a. 36.5 cm b. 262 cm c. 6.75 in.

26. a. 1 cm: 6 mi b. 15 mi

Practice Level B

1. $\frac{x}{y}$ 2. $\frac{6}{13}$ 3. $\frac{y+7}{y}$ 4. $\frac{x+y}{y}$ 5. true
 6. false 7. false 8. true 9. true 10. true
 11. 2 12. 10 13. 12 14. $\frac{25}{3}$ 15. B
 16. If two ratios are equal, then their reciprocals are equal. If $\frac{a}{5} = \frac{b}{3}$, then $\frac{5}{a} = \frac{3}{b}$. 17. 1 in. : 15 mi
 18. 7 19. \$1750 20. 54 ft 21. 2.5 in.
 22. \$19.03 23. \$22.19 24. \$14.45 25. \$15.72

Practice Level C

1. $\frac{x}{5}$ 2. $\frac{y+31}{y}$ 3. $\frac{x}{z}$ 4. $\frac{x+7}{x+2}$
 5. $\frac{6.2+x}{x} = \frac{3.8+y}{y}$ 6. $\frac{x}{6.2} = \frac{y}{3.8}$ 7. $\frac{6.2}{3.8} = \frac{x}{y}$
 8. true 9. true 10. false 11. true 12. 30
 13. 28 14. 7.5 15. 34 16. 1:14 17. 3:1
 18. 8 cm: 1 mm 19. 1 cm: 1.5 in. 20. 2.625 mi
 21. 80 mi 22. 61.5 mi 23. 52.578 mi
 24. a. 1 in. : 22 mi b. 27.5 mi c. 16.5 mi
 25. 10.5 in. 26. 28.8 oz

Review for Mastery

1. 22 2. 12 3. 5 cm : 1 mi 4. 33 cm

Problem Solving Workshop: Using Alternative Methods

1. 15.9 ft; 36 2. 10 ft; 50

Challenge Practice

1. $a = 14, b = 15$ 2. $a = -\frac{10}{3}$ and $b = -6$ or $a = 4$ and $b = 5$

3. $a = 9, b = 36$

4. No; *Sample answer:* Let $a = 4, b = 5, c = 8$, and $d = 10$. Then it is true that $\frac{4}{5} = \frac{8}{10}$.

$$\frac{4 \times 5}{5} = \frac{8 \times 10}{10}$$

$$\frac{20}{5} \stackrel{?}{=} \frac{80}{10}$$

$$4 \neq 8$$

So, the property does not hold.

$$5. \text{Area } \triangle AFE = \frac{1}{2}(AF)(AE),$$

$$\text{Area } \triangle BEC = \frac{1}{2}(BE)(BC),$$

$$\text{Area } \triangle DFC = \frac{1}{2}(DF)(DC).$$

Also, $BC = AD = AF + FD$ and $DC = AB = AE + BE$.

$$\text{So, Area } \triangle AFE = \frac{1}{2}(AF)(AE),$$

$$\text{Area } \triangle BEC = \frac{1}{2}(BE)(AF + FD),$$

$$\text{Area } \triangle DFC = \frac{1}{2}(FD)(AE + BF).$$

Because all the areas are equal,

$$\frac{1}{2}(AF)(AE) = \frac{1}{2}(BE)(AF + FD) =$$

$$\frac{1}{2}(FD)(AE + BE).$$

$$(BE)(AF + FD) = (FD)(AE + BE)$$

$$(BE)(AF) + (BE)(FD) = (FD)(AE) + (FD)(BE)$$

$$\frac{(BE)(AF) + (BE)(FD)}{(BE)(FD)} = \frac{(FD)(AE) + (FD)(BE)}{(FD)(BE)}$$

$$\frac{(BE)(AF)}{(BE)(FD)} + \frac{(BE)(FD)}{(BE)(FD)} = \frac{(FD)(AE)}{(FD)(BE)} + \frac{(FD)(BE)}{(FD)(BE)}$$

$$\frac{(BE)(AF)}{(BE)(FD)} = \frac{(FD)(AE)}{(FD)(BE)}$$

$$\frac{AF}{FD} = \frac{AE}{BE}$$

$$\frac{AE}{EB} = \frac{AF}{FD}$$

6. width = 32.25 yd, length = 43 yd

7. 1.5 in.

Lesson 6.3

Practice Level A

1. $\angle A \cong \angle D, \angle B \cong \angle E, \angle C \cong \angle F;$

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

2. $\angle R \cong \angle W, \angle S \cong \angle V, \angle T \cong \angle U;$

$$\frac{RS}{WV} = \frac{ST}{VU} = \frac{RT}{WU}$$

3. $\angle C \cong \angle M, \angle D \cong \angle J, \angle E \cong \angle K,$

$$\angle F \cong \angle L; \frac{CD}{MJ} = \frac{DE}{JK} = \frac{EF}{KL} = \frac{CF}{ML}$$

4. $\angle P \cong \angle Z, \angle Q \cong \angle W, \angle R \cong \angle X,$

$$\angle S \cong \angle Y; \frac{PQ}{ZW} = \frac{QR}{WX} = \frac{RS}{XY} = \frac{PS}{ZY}$$

Lesson 6.3, continued

5. $\triangle ABC \sim \triangle FDE; \frac{1}{2}$ 6. $GHIJ \sim KLMN; \frac{3}{2}$
 7. not similar 8. $\triangle ABC \sim \triangle FDE; \frac{1}{1}$ 9. 8
 10. 18 11. $\frac{3}{4}; P(\triangle LMN) = 45, P(\triangle PQR) = 60$
 12. $\frac{3}{5}; P(XYZW) = 100, P(STUV) = 60$
 13. altitudes; $x = 24$ 14. medians; $y = 12$
 15. The shadow is not similar to the kite because the corresponding side ratios are not all the same:
 $\frac{95}{78} \approx 1.22 \neq 1.08 \approx \frac{142}{132}$

Practice Level B

1. $\angle A \cong \angle D, \angle B \cong \angle F, \angle C \cong \angle E,$
 $\frac{AB}{DF} = \frac{BC}{FE} = \frac{AC}{DE}$ 2. $\angle W \cong \angle M, \angle X \cong \angle N,$
 $\angle Y \cong \angle O, \angle Z \cong \angle P, \frac{WX}{MN} = \frac{XY}{NO} = \frac{YZ}{OP} = \frac{WZ}{MP}$
 3. C 4. no 5. yes; $BCDA \sim WXYZ; \frac{1}{4}$ or
 $WXYZ \sim BCDA; 4$
 6. $\frac{4}{5}$ 7. 15, 8, 135 8. 40 9. 50 10. $\frac{5}{4}$
 11. $m = 11, n = 4$ 12. $m = 8$ 13. $XY = 30$ in.,
 21 in. 14. 9.75 in. 15. C 16. $\frac{2}{5}$
 17. $XY = 3.6, PN = 15$ 18. 2.32
 19. Area of $\triangle XYZ = 6.96$; Area of
 $\triangle MNP = 43.5$; The area of similar triangles differ
 by the scale factor squared.
 20. $\frac{3}{5}$ 21. 60 ft 22. 3200 ft²

Practice Level C

1. $\angle S \cong \angle C, \angle T \cong \angle D, \angle U \cong \angle E;$
 $\frac{ST}{CD} = \frac{TU}{DE} = \frac{SU}{CE}$
 2. $\angle L \cong \angle G, \angle M \cong \angle H, \angle N \cong \angle I;$
 $\frac{LM}{GH} = \frac{MN}{HI} = \frac{LN}{GI}$
 3. $\angle C \cong \angle M, \angle D \cong \angle N, \angle E \cong \angle K,$
 $\angle F \cong \angle L; \frac{CD}{MN} = \frac{DE}{NK} = \frac{EF}{KL} = \frac{CF}{ML}$
 4. $\triangle LNM \sim \triangle TPO; \frac{4}{3}$
 5. quadrilateral $ABCD \sim$ quadrilateral $HEFG; \frac{5}{8}$
 6. $\frac{2}{3}$ 7. $\frac{3}{2}$ 8. 4.5 9. 117° 10. 24 11. 201.6 ft
 12. 77.4 in. 13. $\frac{rv}{u}$ 14. $\frac{sv}{u}$ 15. $\frac{tv}{u}$ 16. 6

17. -5, 2.5 18. 8 19. -0.4, 15
 20. 8 times greater

Review for Mastery

1. $\frac{9}{10}$ 2. 36 3. $\frac{5}{4}$ 4. 77.5 5. 20

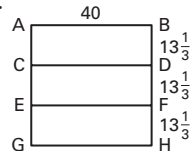
Problem Solving Workshop: Mixed Problem Solving

1. a. 58,800 yen b. about 580.56 Canadian
 dollars 2. a. $\frac{2}{7}, x = 45.5, y = 17.5$ b. 50, 175
 c. 60, 735 d. The ratio of the perimeters is equal
 to the scale factor. The ratio of the areas is equal
 to the square of the scale factor. 3. 517
 4. a. 3.12 in. b. 15 5. 3.2 6. Answers will
 vary. 7. a. 10.6 lb per person b. 42.4 lb; about
 3.53 lb c. about 11 oranges d. *Sample answer:*
 No; Some families eat more fruits than others.
 The oranges could have been used in recipes.

Challenge Practice

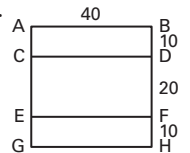
1. $\frac{7}{4}$ 2. 21 cm 3. $JK = 35$ cm, $JL = 36.75$ cm,
 $RS = 20$ cm, $ST = 13$ cm, $RT = 21$ cm
 4. Area of $\triangle JKL = 385.875$ cm²;
 Area of $\triangle RST = 126$ cm²; 3.06251;
 The scale factor of the areas is the square of the
 scale factor of the perimeters.

5. *Sample answer:*



$ABDC \cong CDFE \cong EFHG$

6. *Sample answer:*



$ABDC \sim CDFE; CDFE \sim EFHG, (ABDC \cong EFHG)$