Name ANSWERS Class _____ Date _____

Extra Practice

Chapter 7

7.1

Use a proportion to solve each problem.

$\frac{45}{300} = \frac{x}{3560}$ $x = 534$ apples rotten

1. About 45 of every 300 apples picked at the Newbury Apple Orchard are rotten. If 3560 apples were picked one week, about how many apples were rotten?

$\frac{64}{800} = \frac{x}{9600}$

2. A grocer orders 800 gal of milk each week. He throws out about 64 gal of spoiled milk each week. Of the 9600 gal of milk he ordered over three months, about how many gallons of spoiled milk were thrown out? 768 gallons

$\frac{7}{20} = \frac{x}{13220}$

3. Seven of every 20 employees at V & B Bank Company are between the ages of 20 and 30. If there are 13,220 employees at V & B Bank Company, how many are between the ages of 20 and 30? 4,627

4. About 56 of every 700 picture frames put together on an assembly line have broken pieces of glass. If 60,000 picture frames are assembled each month, about how many will have broken pieces of glass?

$\frac{56}{700} = \frac{x}{60,000}$ $x = 4800$

Use the proportion $\frac{x}{10} = \frac{2}{z}$ Complete each statement. Justify your answer.

14. $\frac{x}{2} = \frac{10}{z}$

15. $\frac{10}{x} = \frac{z}{2}$

16. $\frac{x+10}{10} = \frac{2+z}{z}$

17. The ratio of width to length of a rectangle is 7 : 10. The width of the rectangle is 91 cm. Write and solve a proportion to find the length. 130 cm

$\frac{7}{10} = \frac{91}{x}$

$910 = 7x$

$x = 130$

18. The ratio of the two acute angles in a right triangle is 5 : 13. What is the measure of each angle in the right triangle?

$5x + 13x = 90$

$18x = 90$

$x = 5$

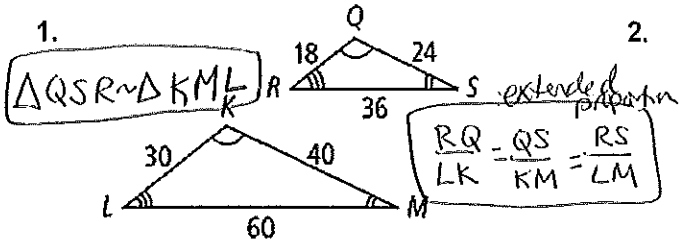
$m\angle 1 = 25°$

$m\angle 2 = 65°$

7.2

If the polygons are similar, write a similarity statement and the extended proportion for the ratios of corresponding sides. If the polygons are not similar, write *not similar*.

1.

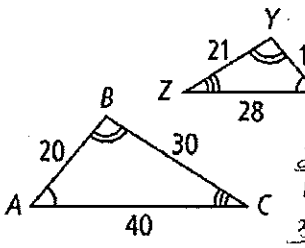


$\frac{18}{30} = \frac{3}{5}$ $\frac{24}{40} = \frac{3}{5}$ $\frac{36}{60} = \frac{3}{5}$

$\triangle QSR \sim \triangle KML$

extended proportion $\frac{RQ}{LK} = \frac{QS}{KM} = \frac{RS}{LM}$

2.

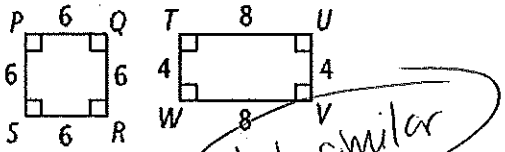


$\triangle XYZ \sim \triangle ABC$

$\frac{XY}{AB} = \frac{YZ}{BC} = \frac{XZ}{AC}$

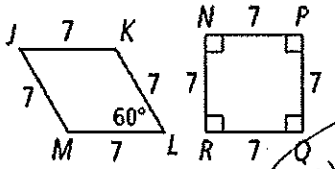
$\frac{20}{14} = \frac{10}{7}$ $\frac{30}{21} = \frac{10}{7}$ ✓ $\frac{40}{28} = \frac{10}{7}$

3.



Not similar

4.

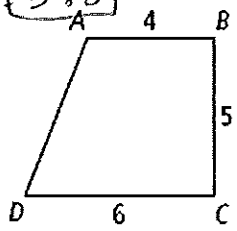


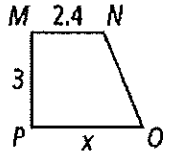
Not similar

Give the scale factor of the polygons. Find the value of *x*. Round answers to the nearest tenth when necessary.

5. $ABCD \sim NMPO$

scale factor 5 : 3



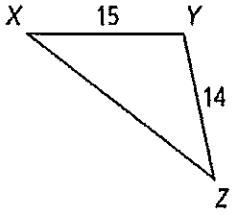


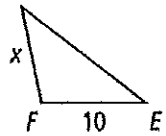
$\frac{5}{3} = \frac{6}{x}$ $5x = 18$ $x = 3.6$

6. $\Delta XYZ, \Delta EFD$

15 : 10

3 : 2 scale factor

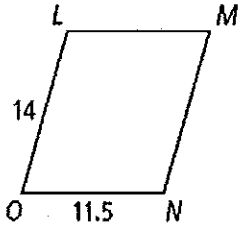




$\frac{14}{x} = \frac{15}{10}$ $15x = 140$

$9.\overline{3}$

7. $LMNO \sim RQTS$

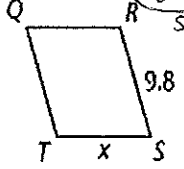


14 : 9.8

140 : 98

70 : 49

10 : 7 scale factor



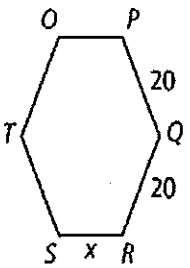
$\frac{14}{9.8} = \frac{11.5}{x}$

$112.7 = 14x$

8.05

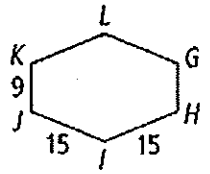
≈ 8.1

8. $OPQRST \sim GHIJKL$



scale factor 20 : 15

4 : 3



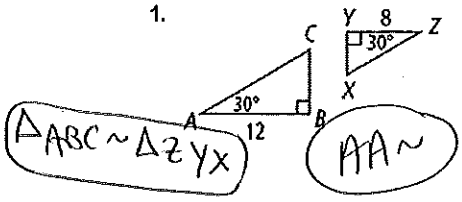
$\frac{20}{15} = \frac{x}{9}$

$15x = 180$

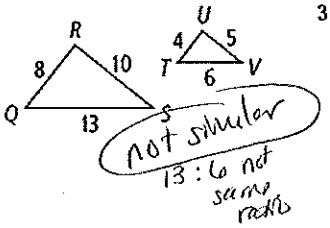
$x = 12$

7.5

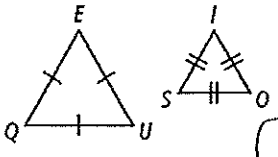
Determine whether the triangles are similar. If so, write a similarity statement and name the postulate or theorem you used. If not, explain.

1. 

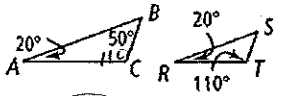
$\triangle ABC \sim \triangle ZYX$ AA~

2. 

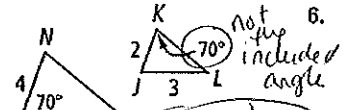
not similar
13 : 6 not same ratio

3. 

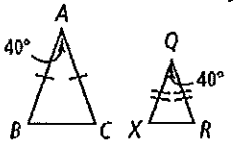
SSS~ (or AA~)
$\triangle EUQ \sim \triangle IOS$

4. 

AA~
$\triangle ABC \sim \triangle RST$

5. 

not the included angle
not similar

6. 

AA~ or SAS~
$\triangle ABC \sim \triangle QXR$

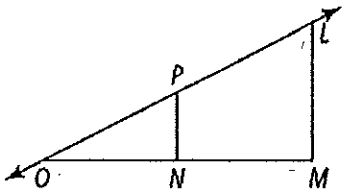
7. Are all equilateral triangles similar? Explain.

yes. all same ratios of sides and all $\angle$'s = 60°

10. Provide the reason for each step in the two-column proof.

Given: $\overline{LM} \perp \overline{MO}$, $\overline{PN} \perp \overline{MO}$

Prove: $\Delta LMO \sim \Delta PNO$



Statements	Reasons
1) $\overline{LM} \perp \overline{MO}, \overline{PN} \perp \overline{MO}$	1) ? given
2) $\angle PNO$ and $\angle LMO$ are right $\angle$s.	2) ? defn. $\perp$
3) $\angle PNO \cong \angle LMO$	3) ? all right $\angle$s $\cong$
4) $\angle O \cong \angle O$	4) ? reflexive
5) $\Delta LMO \sim \Delta PNO$	5) ? AA~

Lesson 7-4

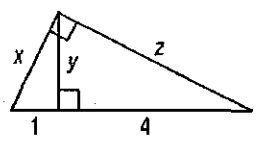
Find the geometric mean for each pair of numbers.

24. 9 and 16 (12)

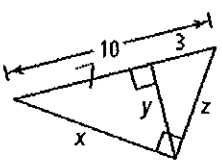
25. 5 and 80 $\frac{5}{x} = \frac{x}{80}$ $x = 20$

26. 8 and 32 (16)

Find the value of each variable. If an answer is not a whole number, leave it in simplest radical form.

27. 

$\frac{1}{y} = \frac{y}{4}$ $y^2 = 4$ $y = 2$
$\frac{1}{x} = \frac{x}{5}$ $x^2 = 5$ $x = \sqrt{5} \approx (2.24)$

28. 

$\frac{7}{y} = \frac{y}{3}$ $y^2 = 21$ $y = \sqrt{21}$ (≈ 4.58)
$\frac{3}{z} = \frac{z}{10}$ $z^2 = 30$ $z = \sqrt{30}$ (≈ 5.48)

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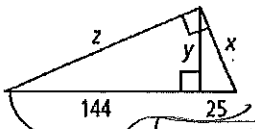
Extra Practice (continued)

Chapter 7

29.



$\frac{144}{z} = \frac{z}{169}$

$z^2 = 24336$

$z = 156$

$\frac{25}{x} = \frac{x}{169}$

$x^2 = 4225$

$x = 65$

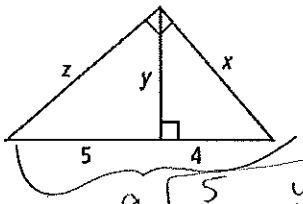
169

$\frac{25}{y} = \frac{y}{144}$

$y^2 = 3600$

$y = 60$

30.



$\frac{4}{x} = \frac{x}{9}$

$x^2 = 36$

$x = 6$

9

$\frac{5}{z} = \frac{z}{9}$

$z^2 = 45$

$z = 3\sqrt{5}$

$\frac{5}{y} = \frac{y}{4}$

$y^2 = 20$

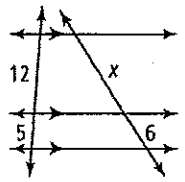
$y = \sqrt{20}$

$2\sqrt{5}$

Lesson 7-5

Find the value of x.

33.

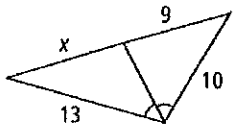


$\frac{12}{5} = \frac{x}{6}$

$5x = 72$

14.4

34.

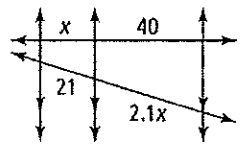


$\frac{13}{x} = \frac{10}{9}$

$10x = 117$

$x = 11.7$

35.



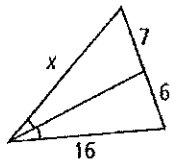
$\frac{x}{21} = \frac{40}{2.1x}$

$840 = 2.1x^2$

$400 = x^2$

$x = 20$

36.

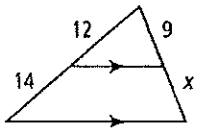


$\frac{x}{7} = \frac{16}{6}$

$112 = 6x$

$x = 18.6$

37.

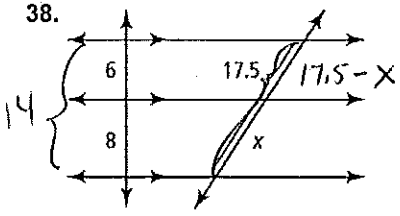


$\frac{12}{14} = \frac{9}{x}$

$126 = 12x$

10.5

38.



$\frac{6}{8} = \frac{17.5 - x}{x}$

$\frac{8}{14} = \frac{x}{17.5}$

$14x = 140$

$x = 10$

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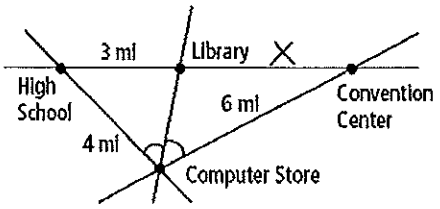
Extra Practice (continued)

Chapter 7

40. The figure below shows the locations of a high school, a computer store, a library, and a convention center. The street along which the computer store and library are located bisects the obtuse angle formed by two of the other streets. Use the information in the figure to find the distance from the library to the convention center.

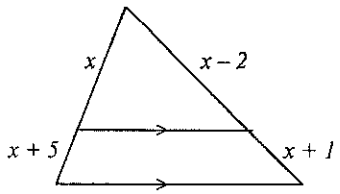


$\frac{4}{3} = \frac{6}{x}$

$18 = 4x$

$x = 4.5$

41. What is the value of x?



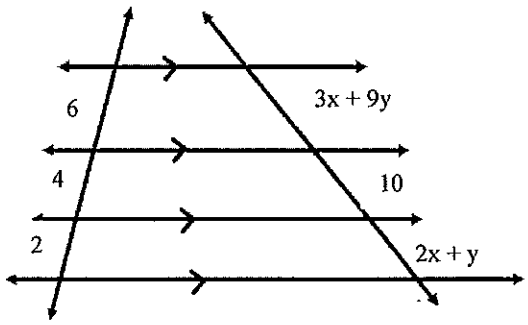
$\frac{x}{x+5} = \frac{x-2}{x+1}$

$x^2 + 3x - 10 = x^2 + x$

$2x = 10$

$x = 5$

42. Find x and y.



$\frac{4}{2} = \frac{10}{2x+y}$

$8x + 4y = 20$

$\frac{6}{4} = \frac{3x+9y}{10}$

$12x + 36y = 60$

$-9(8x + 4y = 20)$

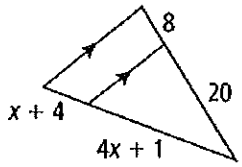
$-72x - 36y = -180$

$-60x = -120$

$x = 2$

Solve for the missing variable(s).

4.



$\frac{20}{8} = \frac{4x+1}{x+4}$

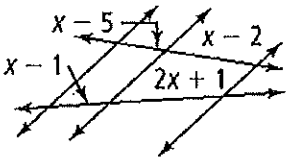
$32x + 8 = 20x + 80$

$-20 \quad -20$

$18x = 72$

$x = 4$

5.



$\frac{x-5}{x-1} = \frac{x-2}{2x+1}$

$x^2 - 3x + 2 = 2x^2 - 9x - 5$

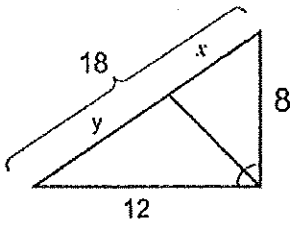
$-x^2 \quad +3x \quad -2 \qquad -x^2 \quad +3x \quad -2$

$0 = x^2 - 6x - 7$

$(x+1)(x-7) = 0$

$x = 7$

6.



$y = 18 - x$

$\frac{12}{18-x} = \frac{8}{x}$

$144 - 8x = 12x$

$144 = 20x$

$x = 7.4$

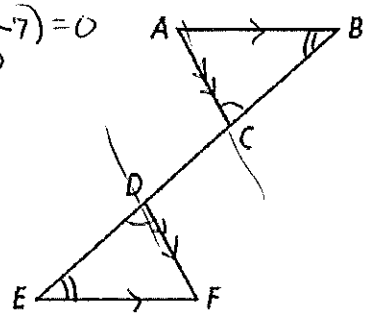
$y = 18 - 7.4$

$y = 10.6$

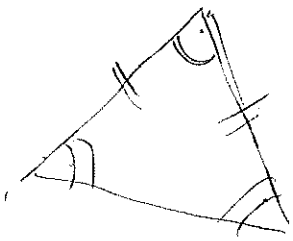
18
8
144

Given: $\overline{AB} \parallel \overline{EF}, \overline{AC} \parallel \overline{DF}$

Prove: $\Delta ABC \sim \Delta FED$

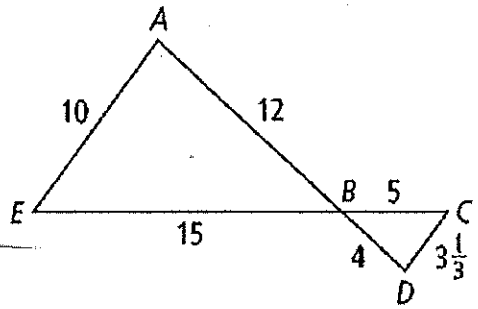


S	R
① $\overline{AB} \parallel \overline{EF}$	① Given
② $\angle B \cong \angle E$	② Alt. int. ∠ Thm
③ $\overline{AC} \parallel \overline{DF}$	③ Given
④ $\angle ACB \cong \angle FDE$	④ Alt. Ext. ∠ Thm
⑤ $\Delta ABC \sim \Delta FED$	⑤ AA~



Given: $\overline{AD}$ and $\overline{EC}$ intersect at B.

Prove: $\Delta ABE \sim \Delta DBC$



S	R
① $\overline{AD}$ & $\overline{EC}$ intersect at B	① Given
② $\angle CBD \cong \angle EBA$	② Vertical ∠ Thm
③ $\frac{4}{12} = \frac{5}{15} = \frac{1}{3}$	③ Simplify
④ $\frac{BD}{BA} = \frac{BC}{BE}$	④ Substitution
⑤ $\Delta ABE \sim \Delta DBC$	⑤ SAS~