Name ANSWERS Class _____ Date _____

Extra Practice

Chapter 7

1. **Solve each proportion.**

a. $\frac{2}{3} = \frac{x}{15}$

$3x = 30$

$x = 10$

b. $\frac{4}{9} = \frac{16}{x}$

$144 = 4x$

$x = 36$

c. $\frac{x}{4} = \frac{6}{12}$

$12x = 24$

$x = 2$

d. $\frac{x}{2} = \frac{3}{9}$

$9x = 6$

$x = \frac{6}{9} = \frac{2}{3}$

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

$4x = 18$

$x = 4.5$

f. $\frac{3}{7} = \frac{9}{x}$

$3x = 63$

$x = 21$

g. $\frac{3}{x+2} = \frac{2}{7}$

$2(x+2) = 21$

$2x + 4 = 21$

$2x = 17$

$x = 8.5$

h. $\frac{4}{5} = \frac{x-3}{9}$

$5x - 15 = 36$

$+15$

$5x = 51$

$x = 10.2$

i. $\frac{12}{x} = \frac{4}{2x-5}$

$4x = 12(2x-5)$

$4x = 24x - 60$

$-20x = -60$

$x = 3$

2. The measures of two complementary angles are in the ratio 7 : 11. What is the measure of the smaller angle?

$7x + 11x = 90$

$18x = 90$

$x = 5$

smaller $\angle = 7(5) = 35°$

3. On a map, the following scale is given: *1.5 cm. = 200 m.* The distance you have to go is *2.7 cm.* long. How far do you have to drive?

$\frac{1.5 \text{ cm}}{200 \text{ m}} = \frac{2.7 \text{ cm}}{x}$

$1.5x = 540$

$x = 360$

4. Given that $\frac{x}{9} = \frac{14}{y}$, complete the following equations. State the property that allows for the new proportion.

a. $xy = 9(14)$

$xy = 126$

b. $\frac{x}{14} = \frac{9}{y}$

c. $\frac{9}{x} = \frac{y}{14}$

d. $\frac{x+9}{9} = \frac{14+y}{y}$

5. List the pairs of congruent angles **AND** extended proportion that relates the corresponding sides for the similar polygons: $ABCD \sim WXYZ$

$\angle A \cong \angle W$

$\angle B \cong \angle X$

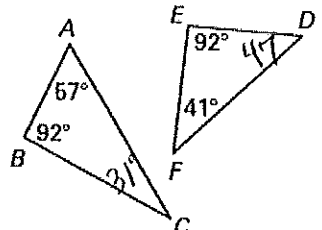
$\angle C \cong \angle Y$

$\angle D \cong \angle Z$

$\frac{AB}{WX} = \frac{BC}{XY} = \frac{CD}{YZ} = \frac{AD}{WZ}$

6. Determine whether or not the triangles below are similar (you may need to do a little work to figure it out) by AA~, SSS~, or SAS~, or none of them. If they are similar, complete the similarity statement.

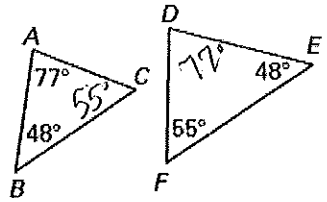
a.



not ~

$\triangle ABC \sim$

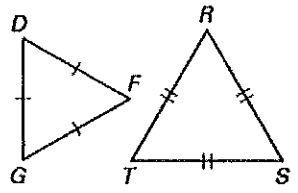
b.



AA~ $\triangle ABC \sim \triangle DEF$

$\triangle ABC \sim \triangle DEF$

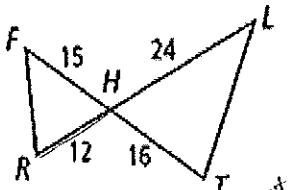
c.



SSS~

$\triangle DGF \sim \triangle RTS$ (could be any order)

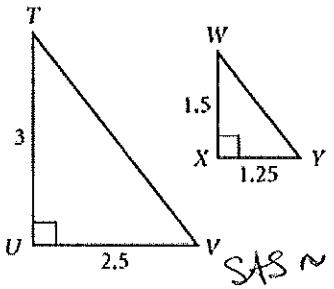
d.



$\frac{18}{46} = \frac{15}{24}$ Not ~ $20 \neq 24$

$\triangle FRH \sim$

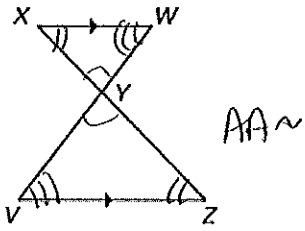
e.



SAS ~

$\triangle TUV \sim \triangle WXY$

f.

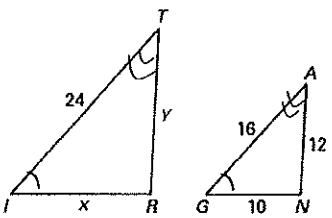


AA~

$\triangle WXY \sim \triangle VZY$

7. Given that the polygons are similar, solve for the missing variables/side lengths and find the scale factor from the smaller figure to the larger.

a.

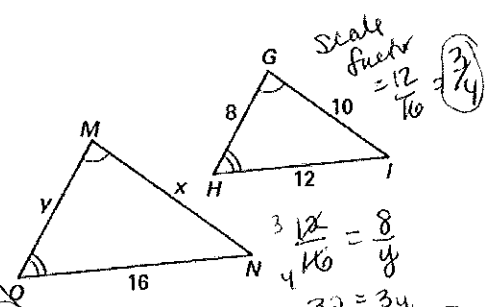


$\frac{16}{24} = \frac{12}{y}$ $\frac{24}{16} = \frac{x}{10}$

$36 = 2y$ $2x = 36$

$y = 18$ $x = 15$

b.



scale factor $= \frac{12}{16} = \frac{3}{4}$

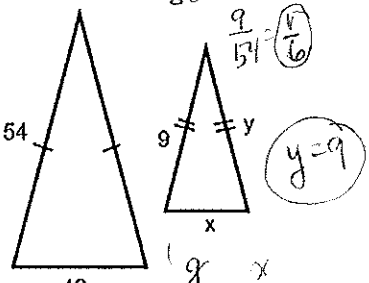
$\frac{12}{16} = \frac{8}{y}$ $\frac{12}{16} = \frac{10}{x}$

$32 = 3y$ $40 = 3x$

$y = 10.6$ $x = 13.3$

scale factor $= \frac{16}{24} = \frac{2}{3}$

c.



scale factor $\frac{9}{54} = \frac{1}{6}$

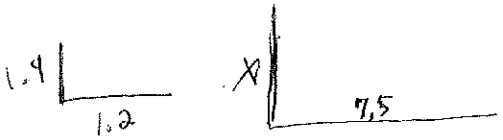
$y = 9$

$\frac{9}{54} = \frac{x}{40}$

$6x = 40$

$x = 6.6$

8. A 1.4-m tall child is standing next to a flagpole. The child's shadow is 1.2 m long. At the same time, the shadow of the flagpole is 7.5 m long. How tall is the flagpole?

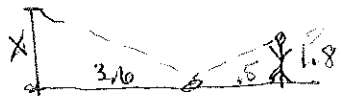


$\frac{1.4}{x} = \frac{1.2}{7.5}$ $x = 8.75$ m

$1.2x = 10.5$

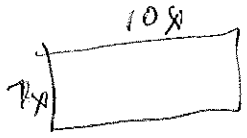
9. To estimate the height of the school's gym, Amber sights the top of the gym wall in a mirror that she has placed on the ground. The mirror is *3.6 m* from the base of the gym wall. If Amber is standing *0.5m* from the mirror and her height is about *1.8 m*, what is the height of the gym wall? Draw and label a diagram for the situation first!

$x = 12.96$ m



$\frac{1.8}{x} = \frac{.5}{3.6}$

$.5x = 6.48$



$7x = 91$

$x = 13$ cm

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.

7.1

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?

$5x + 13x = 90$

$18x = 90$

$x = 5$

Use a proportion to solve each problem.

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? $\frac{45}{300} = \frac{x}{3560}$
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? $\frac{64}{800} = \frac{x}{9600}$ $x = 768$ gal
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? $\frac{7}{20} = \frac{x}{13220}$ 4627 people
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? $\frac{56}{700} = \frac{x}{60,000}$

$300x = 7602200$

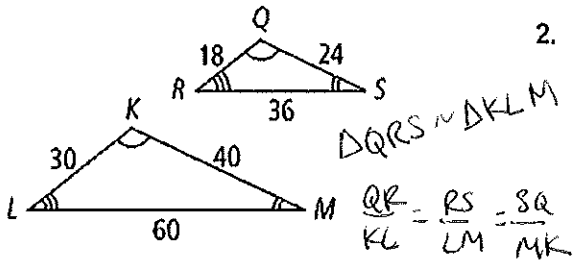
$x = 534$ apples

7.2

$x = 4800$ frames were broken

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*.

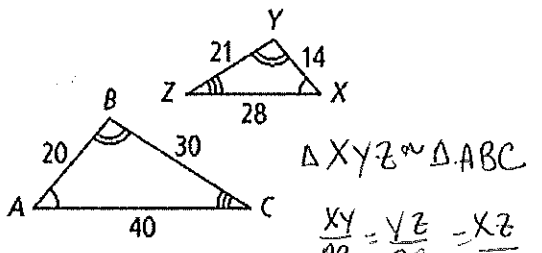
1.



$\triangle QRS \sim \triangle KLM$

$\frac{QR}{KL} = \frac{RS}{LM} = \frac{SQ}{MK}$

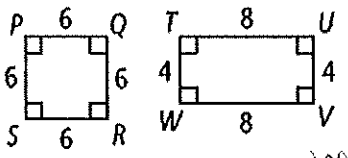
2.



$\triangle XYZ \sim \triangle ABC$

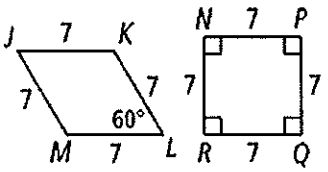
$\frac{XY}{AB} = \frac{YZ}{BC} = \frac{XZ}{AC}$

3.



not similar

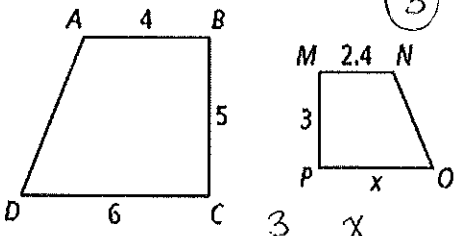
4.



not similar

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

5. *ABCD* ~ *NMPO*



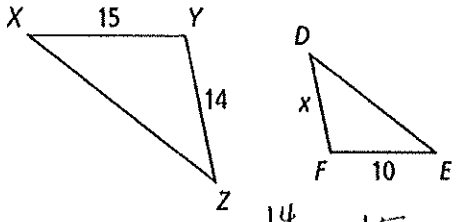
Scale factor = $\frac{5}{3}$

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

$5x = 18$

$x = 3.6$

6. ΔXYZ, ΔEFD



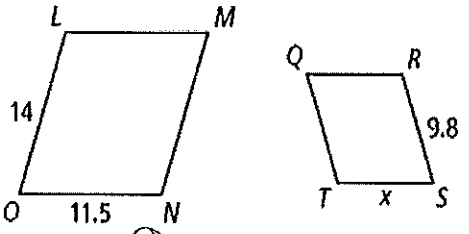
Scale factor

$\frac{15}{10} = \frac{3}{2}$

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

$x = 9.3$

7. *LMNO* ~ *RQTS*



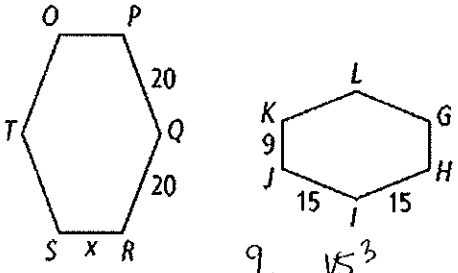
Scale factor = $\frac{7}{1}$

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

$112.7 = 14x$

$x = 8.05$

8. *OPQRST* ~ *GHIJKL*



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

$3x = 36$

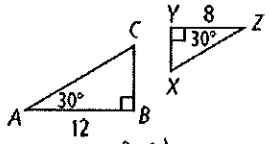
$x = 12$

Scale factor = $\frac{20}{15} = \frac{4}{3}$

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.

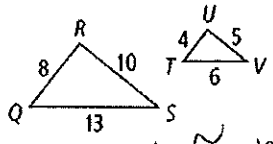
1.



AA~

$\Delta ABC \sim \Delta ZYX$

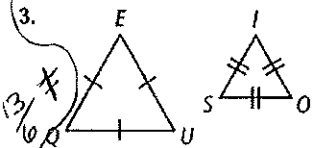
2.



not ~

$\frac{8}{4} = \frac{2}{1}$ $\frac{10}{5} = \frac{2}{1}$ but $\frac{13}{6} \neq$

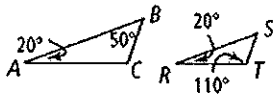
3.



SSS~

$\Delta QUE \sim \Delta SOI$

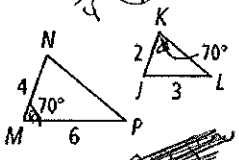
4.



AA~

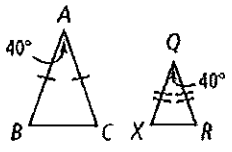
$\Delta ABC \sim \Delta RST$

5.



not ~ one is SAS, the other is NOT

6.



SAS~

$\Delta ABC \sim \Delta QXR$

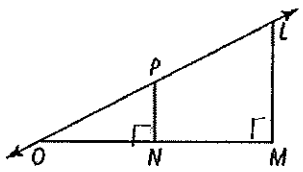
7. Are all equilateral triangles similar? Explain.

yes, by AA~, because all $\angle$'s of equilateral Δ's are 60° each.

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

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

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

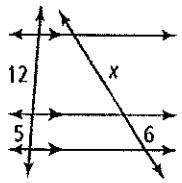


Statements	Reasons
1) $\overline{LM} \perp \overline{MO}, \overline{PN} \perp \overline{MO}$	1) ? Given
2) $\angle PNO$ and $\angle LMO$ are right $\angle$s.	2) ? Defn. $\perp$
3) $\angle PNO = \angle LMO$	3) ? Rt $\angle$s Thm
4) $\angle O \cong \angle O$	4) ? Reflexive
5) $\Delta LMO \sim \Delta PNO$	5) ? AA $\sim$

Lesson 7-5

Find the value of x.

33.

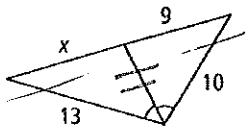


$\frac{12}{5} = \frac{x}{6}$

$5x = 72$

$x = 14.4$

34.

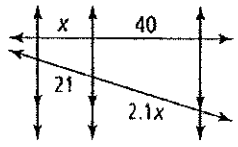


$\frac{x}{13} = \frac{9}{10}$

$117 = 10x$

$x = 11.7$

35.



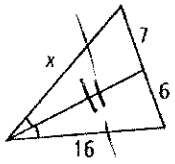
$\frac{x}{40} = \frac{21}{2.1x}$

$\frac{840}{2.1} = \frac{2.1x^2}{2.1}$

$400 = x^2$

$x = 20$

36.

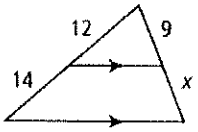


$\frac{x}{7} = \frac{16}{6}$

$\frac{112}{6} = \frac{6x}{6}$

$x = 18.6$

37.

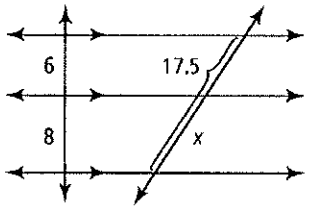


$\frac{12}{14} = \frac{9}{x}$

$126 = 12x$

$x = 10.5$

38.

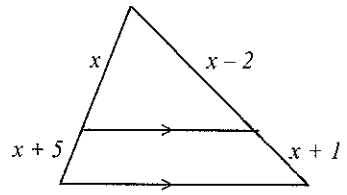


$\frac{6}{8} = \frac{17.5}{x}$

$\frac{140}{6} = \frac{6x}{6}$

$x = 23.\overline{3}$

41. What is the value of x?



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

$(x+5)(x-2) = x(x+1)$

$x^2 - 2x + 5x - 10 = x^2 + x$

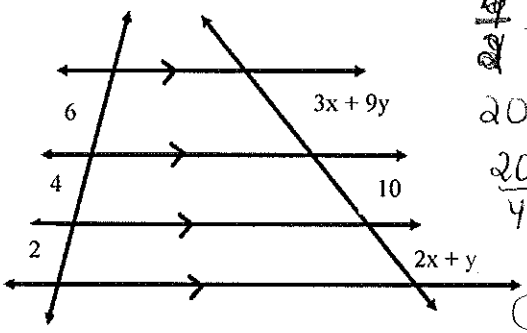
$3x - 10 = x$

$3x - 10 + 10 = x + 10$

$2x = 10$

$x = 5$

42. Find x and y.



$\frac{6}{4} = \frac{10}{2x+y}$

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

$20 = 4(2x+y)$

$12x + 36y = 60$

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

$x + 3y = 5$

$5 = 2x + y$

$x + 3(5-2x) = 5$

$y = 5 - 2x$

$x + 15 - 6x = 5$

$-5x = -10$

$x = 2$

$y = 5 - 2(2)$

$y = 1$