

Chapter 7 Study Guide

Name: Key
 Date: _____ Period: _____

Topic 1: Ratios and Proportions

1. The ratio of the measures of the angles in a triangle is 8:3:4. Find the measures of the angles.

$$8x + 3x + 4x = 180$$

$$\frac{15x}{15} = \frac{180}{15}$$

$$x = 12$$

$$8(12) = 96^\circ$$

$$3(12) = 36^\circ$$

$$4(12) = 48^\circ$$

2. The ratio of the measures of the sides of a triangle is 9:12:5. If the perimeter of the triangles is 130ft, find the measures of the sides.

$$9x + 12x + 5x = 130$$

$$26x = 130$$

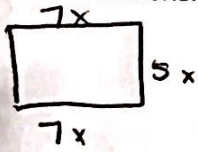
$$x = 5$$

$$9(5) = 45 \text{ ft}$$

$$12(5) = 60 \text{ ft}$$

$$5(5) = 25 \text{ ft}$$

3. The ratio of the length to width of a rectangle is 7:5. If the perimeter of the rectangle is 216 in, find the dimensions of the rectangle.



$$7x + 5x + 7x + 5x = 216$$

$$24x = 216$$

$$x = 9$$

$$7(9) = 63 \text{ in}$$

$$5(9) = 45 \text{ in}$$

4. The angles in a triangle have a ratio of 2:9:4. Find the measure of each angle.

$$2x + 9x + 4x = 180$$

$$15x = 180$$

$$x = 12$$

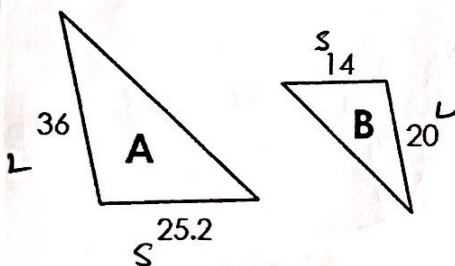
$$2(12) = 24^\circ$$

$$9(12) = 108^\circ$$

$$4(12) = 48^\circ$$

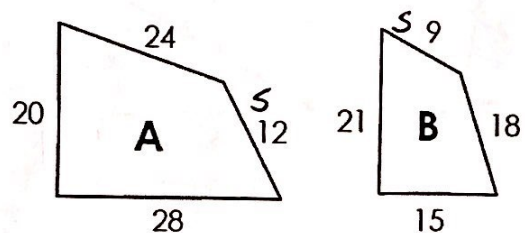
Topic 2: Similar Triangles

5. Find the scale factor of Figure A to Figure B.



$$\frac{36}{20} \rightarrow \boxed{\frac{9}{5}}$$

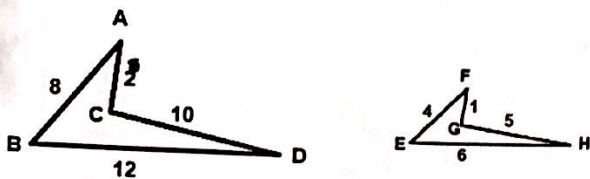
6. Find the scale factor of Figure B to Figure A.



$$\frac{9}{20} \rightarrow \boxed{\frac{3}{4}}$$

Similar figures \rightarrow all angles are congruent (matches)
 \rightarrow Sides are proportional

7. Are the figures similar? If so, write a similarity statement and give the scale factor.



$$\frac{2}{1} \quad \frac{8}{4} \quad \frac{10}{5} \quad \frac{12}{6}$$

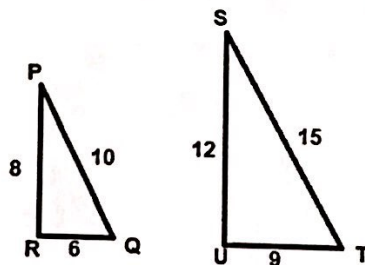
$$2:1$$

yes they are similar
 $\triangle ABC \sim \triangle FEH$

8. Are the figures similar? If so, write a similarity statement and give the scale factor.

$$\frac{6}{9} \quad \frac{8}{12} \quad \frac{10}{15}$$

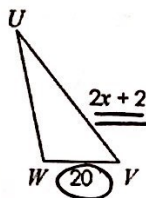
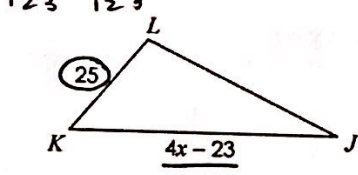
$$\frac{2}{3} \quad \frac{2}{3} \quad \frac{2}{3}$$



yes $\triangle PQR \sim \triangle SUT$
 scale factor of 2:3

9. If $\triangle KIJ \sim \triangle VWU$, find the value of x.

$$\frac{KL}{VW} = \frac{KJ}{VU}$$



$$\frac{25}{20} = \frac{(4x-23)}{(2x+2)}$$

$$20(4x-23) = 25(2x+2)$$

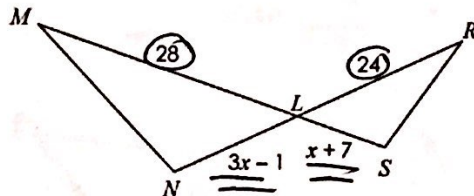
$$80x - 460 = 50x + 50$$

$$30x = 510$$

$$x = 17$$

10. If $\triangle MNL \sim \triangle SRL$, find the value of x.

$$\frac{ML}{RL} = \frac{NL}{SL}$$



$$\frac{28}{24} = \frac{(3x-1)}{(x+7)}$$

$$24(3x-1) = 28(x+7)$$

$$72x - 24 = 28x + 196$$

$$44x = 220$$

$$x = 5$$

11. If $\triangle BED \sim \triangle BCA$, find BC.

$$\frac{BE}{BC} = \frac{BD}{BA}$$

$$\frac{10}{(3x+11)} = \frac{22}{(7x+21)}$$

$$10(7x+21) = 22(3x+11)$$

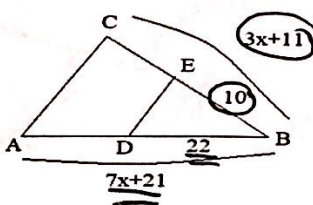
$$70x + 210 = 66x + 242$$

$$4x = 32$$

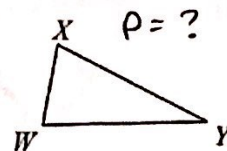
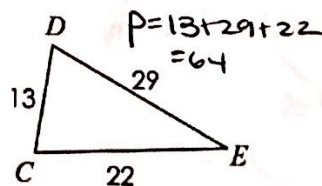
$$x = 8$$

$$BC = 3(8) + 11$$

$$24 + 11 = 35$$



12. If $\triangle CDE \sim \triangle WXY$ with a scale factor of 4:3, find the perimeter of $\triangle WXY$.



$$\frac{4}{3} = \frac{\text{perimeter CDE}}{\text{perimeter WXY}}$$

$$\frac{4}{3} = \frac{64}{x}$$

$$4x = 3(64)$$

$$4x = 192$$

$$x = 48$$

Topic 3: Proving Triangles Similar

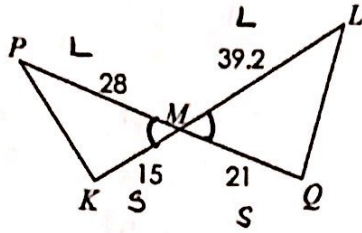
Determine if the triangles are similar. If yes, state how (by AA~, SSS~, or SAS~) and complete the similarity statement.

13.

$$\frac{15}{21} = \frac{28}{39.2}$$

$$\downarrow \quad \downarrow$$

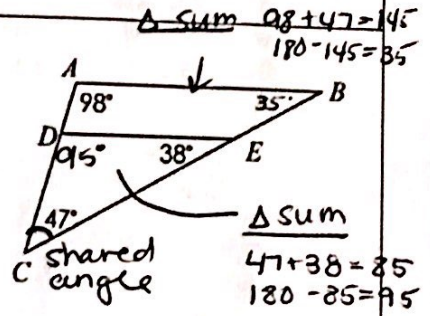
$$\frac{5}{7} = \frac{5}{7}$$



Similar By: SAS~
 $\Delta PKM \sim \Delta LQM$

14.

$$\angle C \cong \angle C$$



only one pair of congruent angles

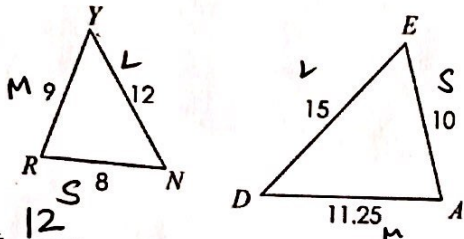
Similar By: none
 $\Delta CAB \sim \underline{\hspace{2cm}}$

15.

$$\frac{8}{10} = \frac{9}{11.25} = \frac{12}{15}$$

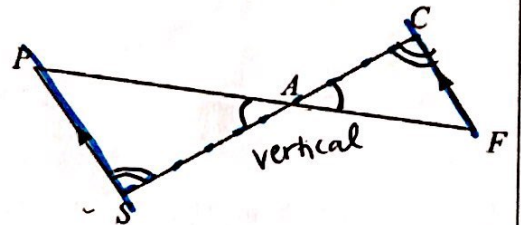
$$\downarrow \quad \downarrow \quad \downarrow$$

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



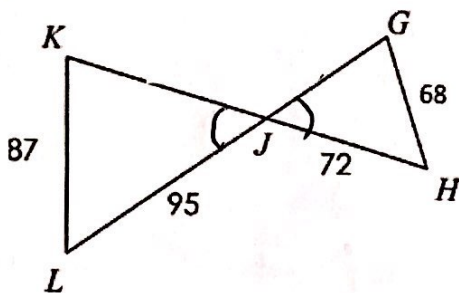
Similar By: SSS~
 $\Delta RYN \sim \Delta ADE$

16.



Similar By: AA~
 $\Delta PAS \sim \Delta FAC$

17.



*angle is in the wrong position

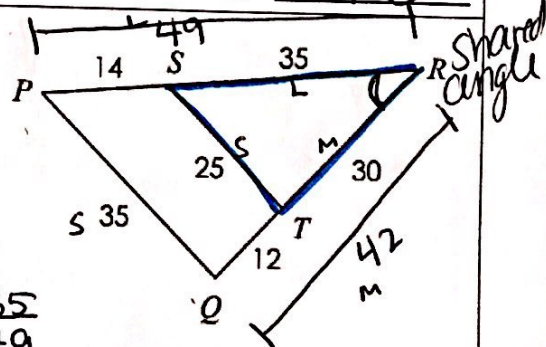
Similar By: none
 $\Delta KJL \sim \underline{\hspace{2cm}}$

18.

$$\frac{25}{35} = \frac{30}{42} = \frac{35}{49}$$

$$\downarrow \quad \downarrow \quad \downarrow$$

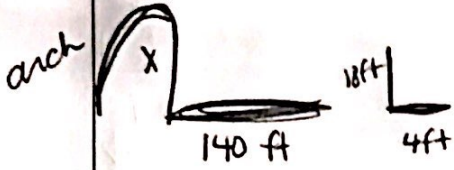
$$\frac{5}{7} = \frac{5}{7} = \frac{5}{7}$$



Similar By: SSS~ or SAS~
 $\Delta PQR \sim \Delta STR$

Topic 4: Indirect measurement

19. The Gateway Arch in Missouri casts a 140ft shadow while an 18ft pole casts a 4ft shadow. How tall is the Arch?



$$\frac{x}{18} = \frac{140}{4}$$

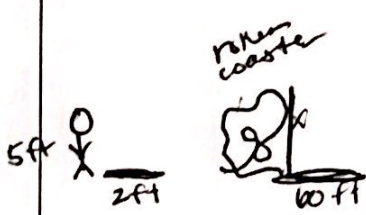
$$18(140) = 4x$$

$$2520 = 4x$$

$$630 = x$$

630 ft

20. Kate would like to find the height of her favorite rollercoaster at the amusement park. She noticed that she casts a 2ft shadow while the rollercoaster casts a 60ft shadow. If Kate is 5ft tall, how tall is the coaster?



$$\frac{5}{x} = \frac{2}{60}$$

$$5(60) = 2x$$

$$300 = 2x$$

$$150 = x$$

150 ft

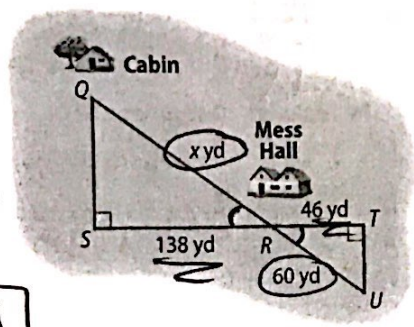
21. In the figure, $\Delta QRS \sim \Delta URT$. Find the distance from the Cabin to the Mess Hall.

$$\frac{138}{40} = \frac{x}{60}$$

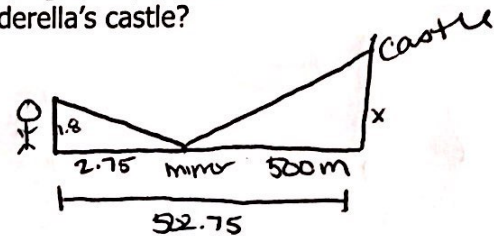
$$40x = 138(60)$$

$$40x = 8280$$

x = 180 yd



22. In Disney world, Cinderella's castle stands in the middle of the park. Sally wants to find how tall it is. Sally places a mirror 500m from the castle and stands 502.75m from the castle to see the top. If the height Sally's eyes is 1.8m, how tall is Cinderella's castle?



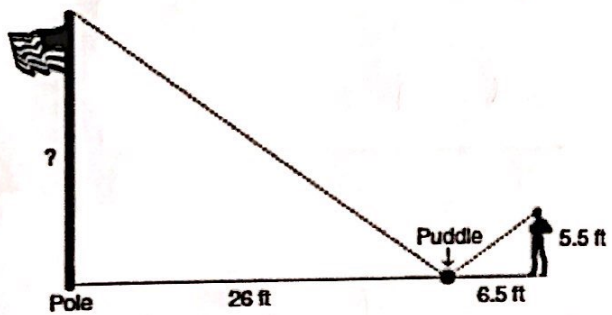
$$\frac{1.8}{x} = \frac{2.75}{500}$$

$$2.75x = 1.8(500)$$

$$2.75x = 900$$

x = 327.3 ft

23. As shown in the drawing, Raymond used similar triangles to find the height of a pole. When he stood 6.5 feet from a small puddle, he could see the reflection of the top of the pole in the puddle. The puddle was 26 feet from the pole, and Raymond's eye level was 5.5 feet about the ground. What is the height of the pole?



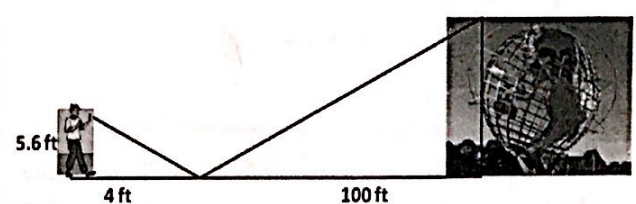
$$\frac{5.5}{x} = \frac{6.5}{26}$$

$$6.5x = 5.5(26)$$

$$6.5x = 143$$

x = 22 ft

24. To estimate the height of the Unisphere, the World's largest globe, you can place a mirror on the ground and stand where you can see the top of the Unisphere in the mirror, as shown in the diagram. What is the height of the Unisphere?



$$\frac{5.6}{x} = \frac{4}{100}$$

$$4x = 5.6(100)$$

$$4x = 560$$

x = 140 ft