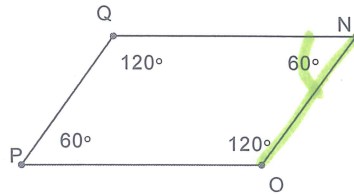
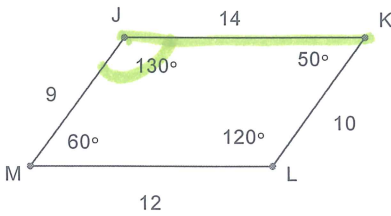


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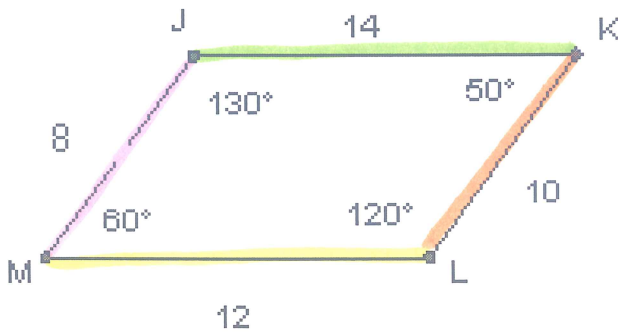
Unit 8: Similarity Test Review

1. Is $\triangle JKL$ similar to $\triangle NOPQ$? Explain why or why not.



No, corresponding angles are not \cong and the SLRs cannot be compared.

2. Is $\triangle JKL$ similar to $\triangle RSTU$? Explain why or why not.



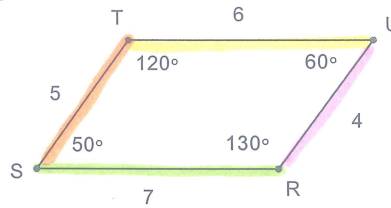
SLRs:

$$\frac{JK}{SR} = \frac{14}{7} = \frac{2}{1}$$

$$\frac{KL}{ST} = \frac{10}{5} = \frac{2}{1}$$

$$\frac{LM}{TU} = \frac{12}{6} = \frac{2}{1}$$

$$\frac{JM}{UR} = \frac{8}{4} = \frac{2}{1}$$



Angles: $\angle J \cong \angle R$ $\angle L \cong \angle T$
 $\angle K \cong \angle S$ $\angle M \cong \angle U$

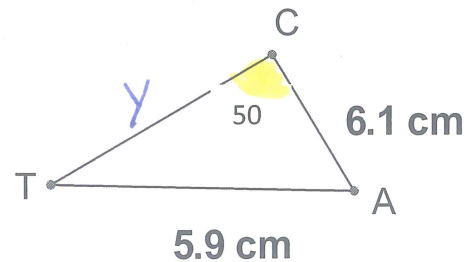
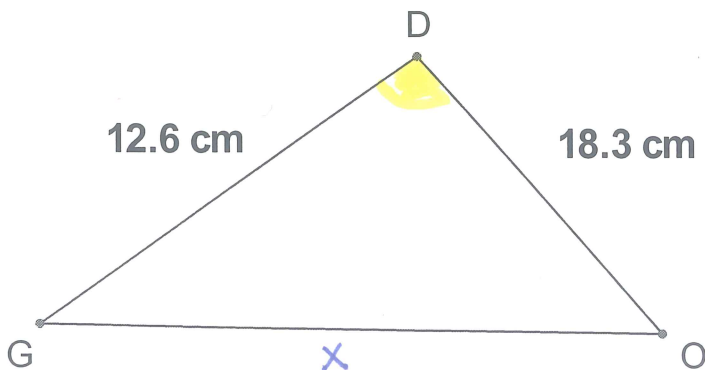
Yes, corresponding angles are \cong and SLRs are =

3. $\triangle DOG \sim \triangle CAT$. Determine the following measurements. Show all your work.

$m\angle D = 50^\circ$ $GO = 17.7 \text{ cm}$ $CT = 4.2 \text{ cm}$

Find GO:

$$\frac{GO}{AT} = \frac{DO}{CA} \cdot \frac{x}{5.9} = \frac{18.3}{6.1}$$



Find CT:

$$\frac{y}{12.6} = \frac{6.1}{18.3}$$

← small \triangle
← large \triangle

In Questions 4 – 7, for each situation:

- Draw a picture if one is not drawn for you
- Show all work that you performed to determine your answer.

4. A flagpole 5 meters tall casts a 3-meter shadow. At the same time of day, a nearby building casts a 32-meter shadow. How tall is the building?

$$\frac{x}{5} = \frac{32}{3}$$

← building
← flagpole

$$3x = 160$$

$$x = 53.\bar{3} \text{ m}$$

5. Miranda is 5 feet tall. She casts a 6 foot shadow at a particular time of day. How tall is her friend if, at the same time of day, his shadow is 1 feet taller than hers?

$$\frac{x}{5} = \frac{7}{6}$$

friend
Miranda

$$6x = 35$$

$$x = 5.\bar{8} \text{ ft}$$

6. Sadie wants to find the height of the tallest building in her city. She stands 109 feet away from the building. There is a tree 43 feet in front of her that is 15 feet tall. How tall is the building to the nearest foot?

large $\Delta \rightarrow \frac{x}{109}$
small $\Delta \rightarrow \frac{15}{43}$

$$43x = 1635$$

$$x = 38.02$$

$$x \approx 38 \text{ ft tall}$$

7. Scott placed a mirror on the ground between himself and his neighbor's house so that he can see into one window. The mirror is 2.43 meters from his feet and 9.32 meters from the base of the other house. Scott's eye is 1.85 meters above the ground. How high is the window?

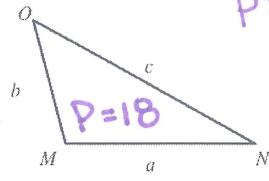
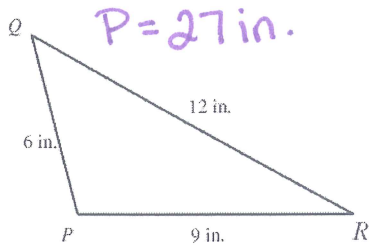
$$\frac{1.85}{x} = \frac{2.43}{9.32}$$

$$2.43x = 17.242$$

$$x = 7.095 \text{ m}$$

8. $\triangle QPR \sim \triangle OMN$

Find a , b , and c if the perimeter of $\triangle MON$ is 18 inches. All measurements are in inches.



$PR = SLR$, so if you know your PR , then you can set up SLR w/ proportions.

$$PR = \frac{18}{27} = \frac{2}{3}$$

Find a

$$\frac{2}{3} = \frac{a}{9} \quad 18 = 3a \quad \boxed{a = 6 \text{ in.}}$$

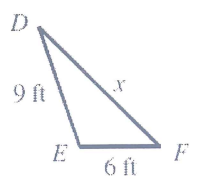
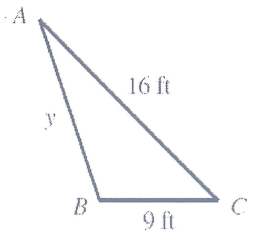
Find b

$$\frac{2}{3} = \frac{b}{6} \quad 3b = 12 \quad \boxed{b = 4 \text{ in.}}$$

Find c

$$\frac{2}{3} = \frac{c}{12} \quad 24 = 3c \quad \boxed{c = 8 \text{ in.}}$$

9. Given that $m\angle A \cong m\angle D$ and $m\angle C \cong m\angle F$, find x and y . (Round to the nearest whole number if necessary.)



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

Find x: $\frac{3}{2} = \frac{16}{x}$

$$3x = 32$$

$$\boxed{x = 10.6 \text{ ft}}$$

$$\boxed{x = 11 \text{ ft}}$$

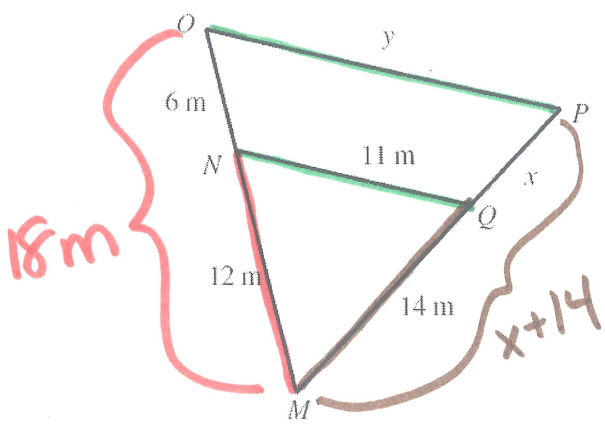
Find y: $\frac{3}{2} = \frac{y}{9}$

$$2y = 27$$

$$y = 13.5 \quad \boxed{y = 14 \text{ ft}}$$

10. $\overline{OP} \parallel \overline{NQ}$

Find the values of x and y .



$$\frac{y}{11} = \frac{18}{12}$$

$$12y = 198$$

$$\boxed{y = 16.5}$$

$$\frac{x+14}{14} = \frac{18}{12}$$

$$12(x+14) = 252$$

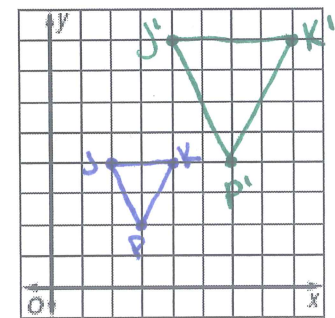
$$12x + 168 = 252$$

$$12x = 84$$

$$\boxed{x = 7}$$

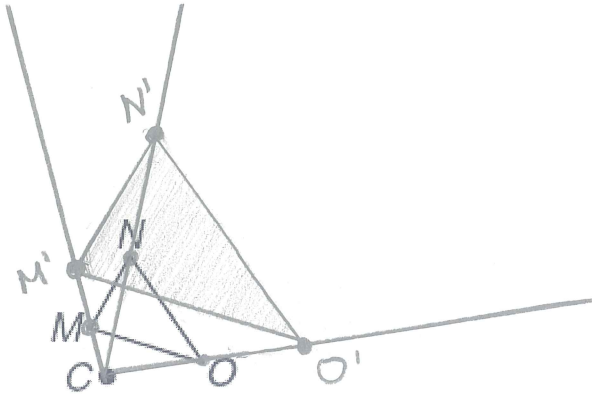
11. Graph the given points and draw the image under dilation with the center at the origin and the scale factor of 2.

$J(2, 4), K(4, 4), P(3, 2)$



preimage $\triangle JKP$
image $\triangle J'K'P'$

12. Draw the image of $\triangle MNO$ under a dilation with the center C and a scale factor of 2.

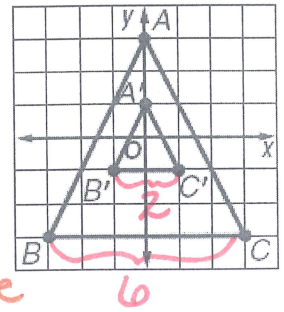


13. If $\triangle A'B'C'$ is the image of $\triangle ABC$ under a dilation centered at the origin, what is the scale factor? Is it a reduction or enlargement?

$$r = \frac{\text{image}}{\text{preimage}}$$

$$r = \frac{2}{6} = \frac{1}{3}$$

reduction because r is less than 1



14. What are the two things you must have in order to have similar polygons?

1. corresponding angles are \cong
2. SLRs are equal (proportional sides)

15. a. If two polygons are congruent, are they also similar?

Yes, with an SLR = 1 (congruence transformation)

b. If two polygons are similar, are they also congruent polygons?

No, they are only proportional unless they have SLR = 1

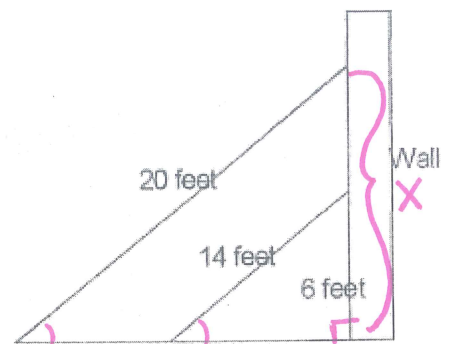
16. Two ladders are leaning against a wall such that they make the same angle with the ground. The 14 foot ladder reaches 6 feet up the wall. How much further does the 20 foot ladder reach (than the 14 foot ladder)?

$$\frac{20}{14} = \frac{x}{6} \quad 14x = 120$$

$$x = 8.57 \text{ ft}$$

$$8.57 - 6 = 2.57 \text{ ft}$$

The 20 ft ladder reaches 2.57 ft higher than the 14 ft ladder.



17. There are 182 girls in the sophomore class of 305 students.

- a) Find the ratio of boys to girls in the sophomore class. $123 : 182$
- b) Find the ratio of boys to the sophomore class. $123 : 305$
- c) Find the ratio of girls to the sophomore class. $182 : 305$

$$\text{boys} = \text{students} - \text{girls} = 305 - 182$$

$$\text{boys} = 123$$

18. There are 27 oranges and 18 grapefruit in a fruit bowl. What is the ratio of oranges to grapefruit?

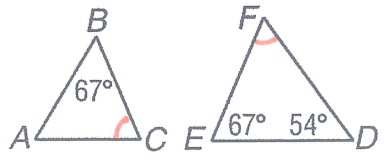
$$27 : 18 \Rightarrow \boxed{3 : 2}$$

19. The ratio of the perimeters of two similar rhombii is 12:13. The larger rhombus has a side length of 60 inches. Find the side length of the smaller rhombus.

$$PR = \frac{12}{13} \quad \frac{12}{13} = \frac{x}{60} \quad 13x = 720$$

$$\boxed{x = 55.38 \text{ in.}}$$

20. If $\triangle ABC \sim \triangle DEF$, find $m\angle C$



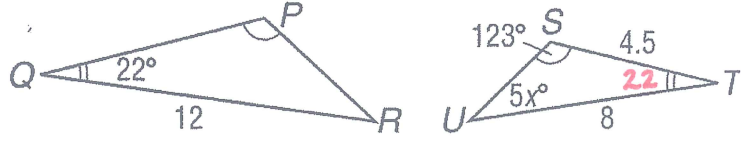
$\angle F \cong \angle C \therefore$ find $\angle F$ first

$$67 + 54 + x = 180$$

$$x = 59^\circ$$

$$\boxed{\angle C = 59^\circ}$$

21. If $\triangle PQR \sim \triangle STU$, find x .



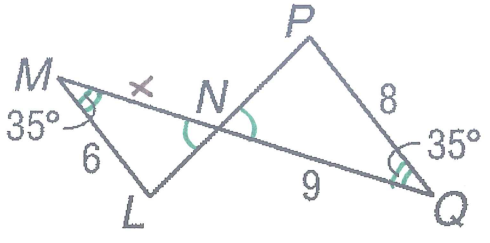
$$123 + 22 + 5x = 180$$

$$5x + 145 = 180$$

$$5x = 35$$

$$\boxed{x = 7}$$

22. Identify the similar triangles. State the similarity postulate (shortcut) used to prove they are similar. Find MN.



$\triangle NML \sim \triangle NQP$ by AA similarity

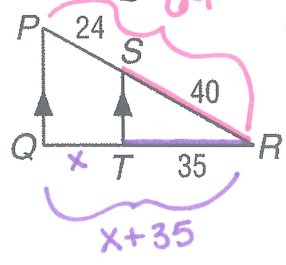
$$\frac{6}{8} = \frac{x}{9}$$

$$54 = 8x$$

$$x = 6.75$$

$$\boxed{MN = 6.75}$$

23. Find QT.



$$\frac{35}{x+35} = \frac{40}{64}$$

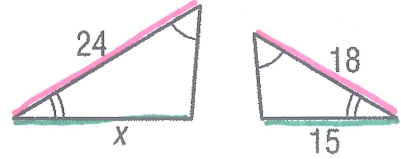
$$40x + 1400 = 2240$$

$$40x = 840$$

$$x = 21$$

$$\boxed{QT = 21}$$

24. Find x.

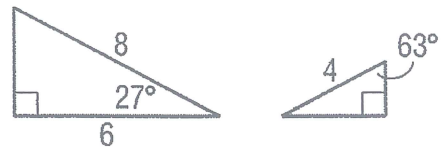


$$\frac{24}{18} = \frac{x}{15}$$

$$18x = 360$$

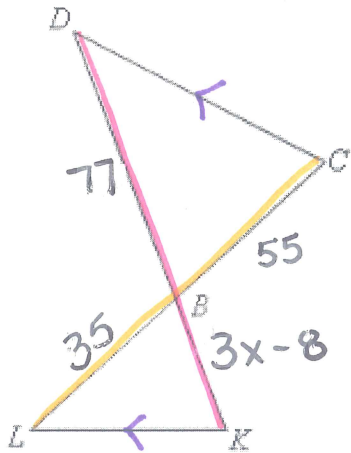
$$\boxed{x = 20}$$

25. Which theorem/postulate can be use to prove that these two triangles are similar?



AA similarity

26. If $DC \parallel LK$, find x .



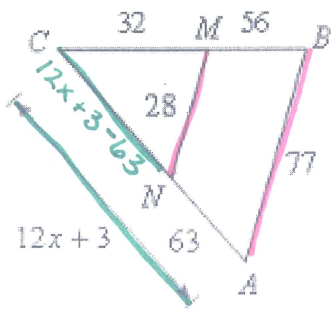
$$\frac{77}{3x-8} = \frac{55}{35}$$

$$165x - 440 = 2695$$

$$165x = 3135$$

$$\boxed{x = 19}$$

27. If $AB \parallel MN$, find x .



$$\frac{77}{28} = \frac{12x+3}{12x+3-63} \Rightarrow \frac{77}{28} = \frac{12x+3}{12x-60}$$

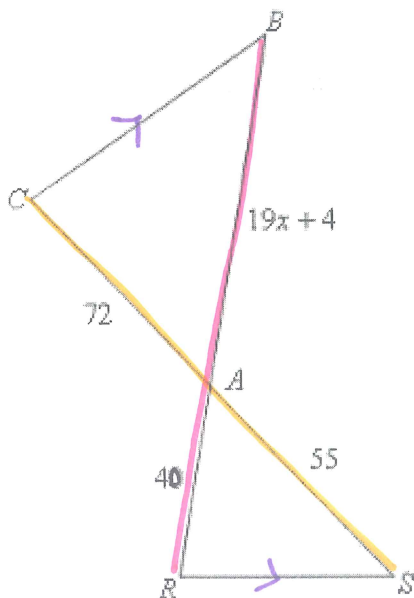
$$336x + 84 = 924x - 4620$$

$$336x + 4704 = 924x$$

$$4704 = 588x$$

$$\boxed{8 = x}$$

28. If $CB \parallel RS$, find x .



$$\frac{19x+4}{40} = \frac{72}{55}$$

$$1045x + 220 = 2880$$

$$1045x = 2660$$

$$\boxed{x = 2.54}$$