Chapter 11 REVIEW

Name: Key
Date: _____ Period: _____

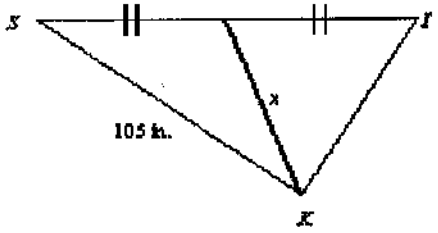
a. Define the 2 traits necessary for similar figures: Corresponding angles must be congruent & corresponding sides must be proportional

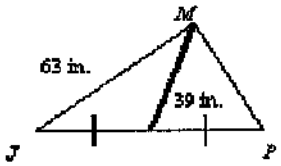
b. Name 3 similarity shortcuts for triangles: AA, SSS, SAS

c. If a figure has the ratio of sides = 2/3, then the ratio of the areas = $\frac{4}{9}$.

d. If a figure has the ratio of sides = 2/3, then the ratio of the volumes = $\frac{8}{27}$.

e. A **median** of a triangle is the segment joining a vertex to the midpoint of the side opposite that vertex. The medians of two similar triangles are proportional to their corresponding sides. Use this to solve for **x**.





$\frac{39}{x} = \frac{63}{105}$

$63x = 4095$

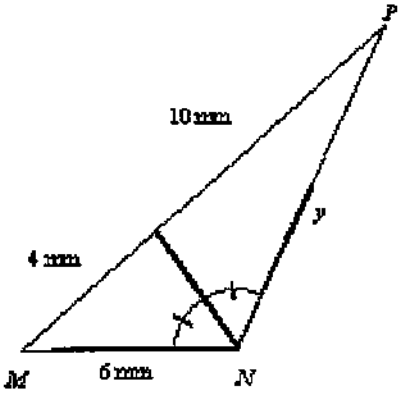
$x = 65$ in

f. An **angle bisector** in a triangle divides the opposite side into segments that are proportional to the other two sides. Use this to solve for **y**.

$\frac{4}{10} = \frac{6}{y}$

$4y = 60$

$y = 15$ mm

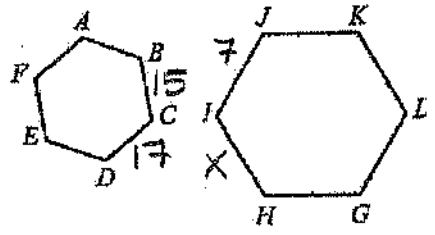


Solve each proportion.

1. $\frac{d}{22} = \frac{72}{18}$ $18d = 1584$ $d = 88$

2. $\frac{x}{16} = \frac{(x+3)}{28}$ $16(x+3) = 28x$ $16x + 48 = 28x$ $-16x \quad -16x$ $48 = 12x$ $x = 4$

3. $ABCDEF \sim GHIJKL$
Find $\overline{HI}$ to the nearest tenth if $BC = 15$ millimeters, $CD = 17$ millimeters, and $IJ = 7$ millimeters.



$\frac{15}{x} = \frac{17}{7}$

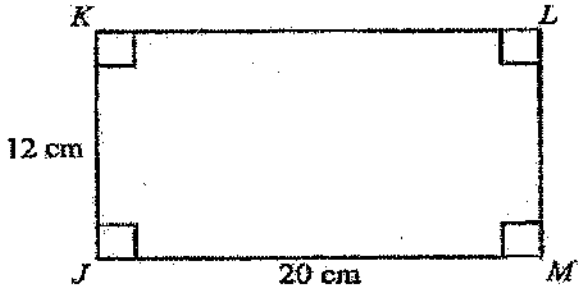
$17x = 105$

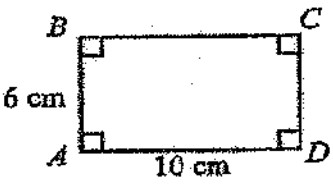
$x = 6.176$

$HI = 6.2$ mm

Are rectangles $KLMJ$ and $BCDA$ similar? Explain why or why not.

4.



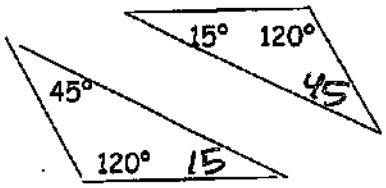


$\frac{6}{12} = \frac{10}{20}$

$\frac{1}{2} = \frac{1}{2}$

Yes, corresponding angles are congruent & corresponding sides are proportional

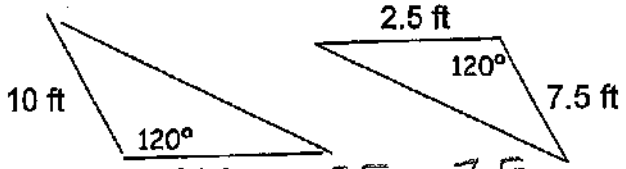
5a. Are these triangles similar?



YES or NO_____

Explain/Work: AA Similarity

5b. Are these triangles similar?



$\frac{2.5}{10} = \frac{7.5}{30}$

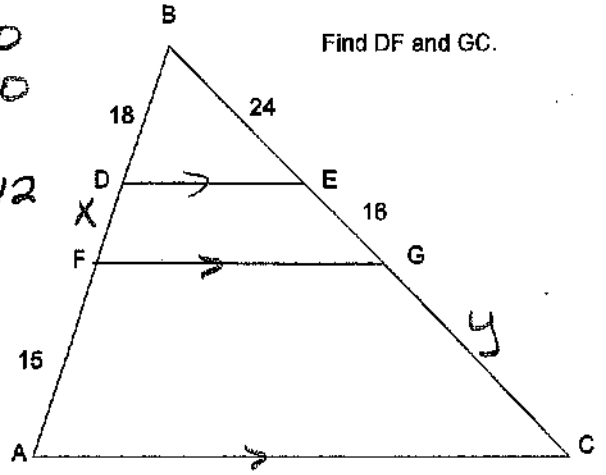
$\frac{1}{4} = \frac{1}{4}$

YES or NO_____

Explain/Work: SAS Similarity

6.

Given: $\triangle ABC$ with $\overline{DE} \parallel \overline{FG} \parallel \overline{AC}$



Find DF and GC.

$\frac{18}{x+18} = \frac{24}{40}$

$24(x+18) = 720$

$24x + 432 = 720$

$24x = 288$

$x = 12$ DF = 12

$\frac{18}{45} = \frac{24}{40+y}$

$18(40+y) = 1080$

$720 + 18y = 1080$

$18y = 360$

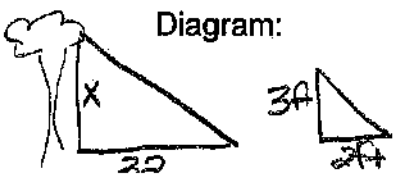
$y = 20$ GC = 20

Can you find the length of EC?

EC = 36

7. A yardstick casts a shadow 2ft long at the same time a tree casts a shadow 32 ft long. How tall is the tree, to the nearest foot?

Diagram:



Proportion:

$\frac{x}{3} = \frac{32}{2}$

$2x = 96$

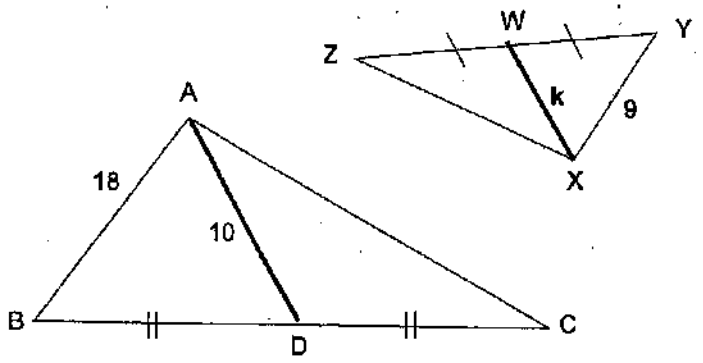
$x = 48$

Height: 48 ft

8. Find k. What is the name of the line from **A** and **X** that is drawn to the **midpoint (middle)** of the opposite side? median What does each line do to the original triangle?

cuts it in half

$\Delta ABC \sim \Delta XYZ$. Find k.



$\frac{k}{10} = \frac{9}{18}$

$18k = 90$

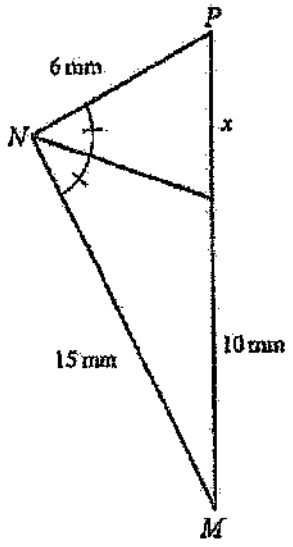
$k = 5$

k = 5

9. An Angle Bisector divides the opposite sides into segments that are proportional to the other two sides.

Find x.

Set up the proportions:



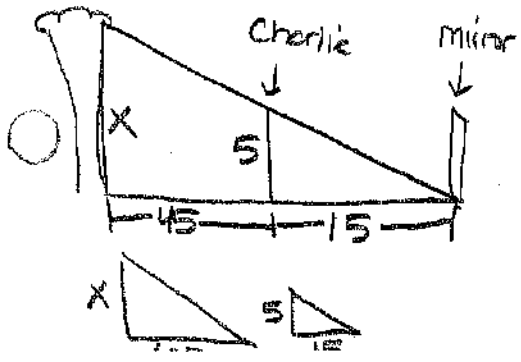
$\frac{x}{10} = \frac{6}{15}$

$15x = 60$

$x = 4$

10. Charlie wants to measure the height of a tree outside his house. He places a mirror on the ground in front of himself and the tree and stands so that when he looks into the mirror, he sees the top of the tree. The mirror is 15 ft from his feet and 45 ft from the base of the tree. Charlie's eye is 5 ft above the ground. What is the height of the tree?

Diagram:



Proportion:

$\frac{5}{x} = \frac{15}{60}$

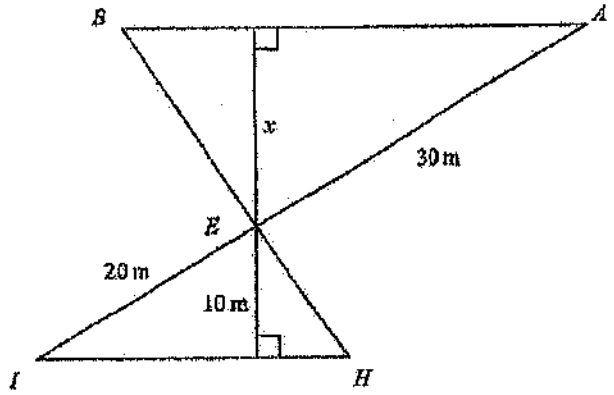
$15x = 300$

$x = 20$

Height: 20 ft

$\Delta BAE \sim \Delta HIE$

11. Find x.



$\frac{10}{x} = \frac{20}{30}$

$20x = 300$

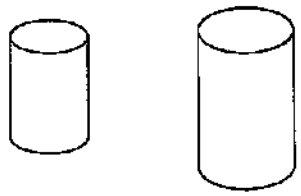
$x = 15$

12. The ratio of the volumes of two similar boxes is 27:64.

What is the ratio of their heights? $\sqrt[3]{\frac{27}{64}} = \frac{3}{4}$

13. The ratio of the areas of two cylinders is 16:25.

What is the ratio of their volumes? $\frac{64}{125}$

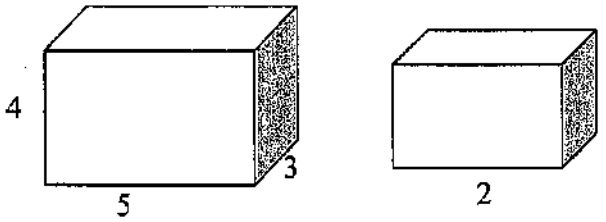


Ratio of Sides = $\sqrt{\frac{16}{25}} = \frac{4}{5}$

Ratio of Volumes = $\left(\frac{4}{5}\right)^3 = \frac{64}{125}$

14. The rectangular shipping crates are similar.

What is the ratio of their volumes? $\frac{8}{125}$



Ratio of Sides = $\frac{2}{5}$

Ratio of Volumes = $\left(\frac{2}{5}\right)^3 = \frac{8}{125}$

15. TRI ~ ANG. Find RI.

$\frac{\text{Area of TRI}}{\text{Area of ANG}} = \frac{121}{225}$

RI = 11 m

Area Ratio = $\frac{121}{225}$

Side Ratio = $\frac{11}{15}$

$\frac{x}{25} = \frac{11}{25}$

$25x = 275$

$x = 11$