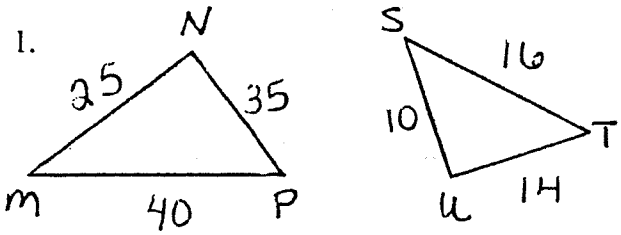
Name KEY

Geometry (H) – Chapter – Review

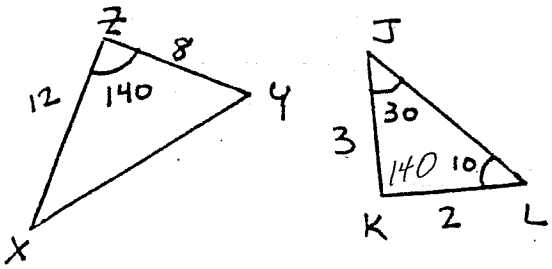
Determine whether the two triangles shown are similar. If so, state the postulate or theorem that justifies your answer. Write a similarity statement.

1.



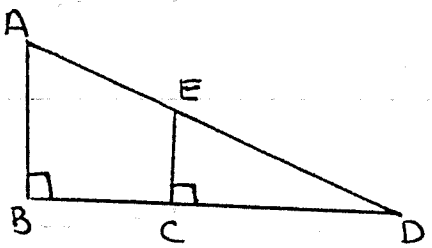
yes, $\triangle MNP \sim \triangle SUT$
SSS similarity

2.



Yes, $\triangle XYZ \sim \triangle JLK$
SAS similarity

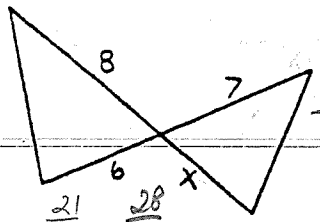
3.



Yes, $\triangle ABD \sim \triangle ECD$
A.A. similarity

Find the values of x that make the triangles similar by the SAS similarity theorem.

4.



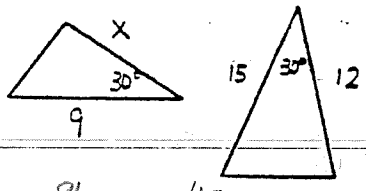
$\frac{x}{6} = \frac{7}{8}$ OR $\frac{x}{8} = \frac{7}{6}$

$6x = 56$

$x = \frac{28}{3}$

x = $\frac{21}{4}$, $\frac{28}{3}$

5.



x = $\frac{36}{5}$ or $\frac{45}{4}$

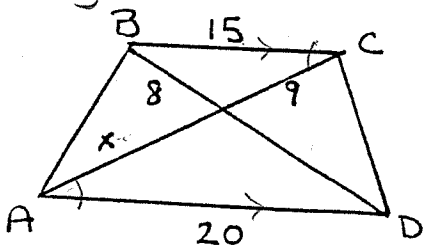
$\frac{12}{x} = \frac{15}{9}$ or $\frac{15}{x} = \frac{12}{9}$

$12x = 15(9)$

$x = \frac{5}{4}(9)$

$x = \frac{45}{4}$

6. $\overline{BC} \parallel \overline{AD}$. Find x



x = 12

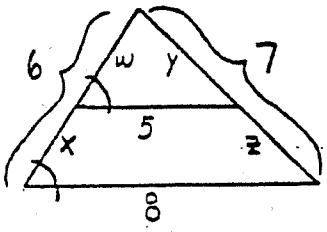
$\frac{15}{9} = \frac{20}{x}$

$15x = 9(20)$

$x = 12$

Find the length of each segment.

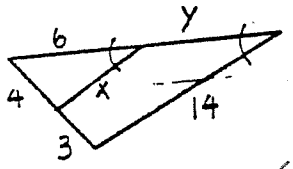
7.



$\frac{w}{6}=\frac{5}{8}$ w = $\frac{15}{4}$ x = $2\frac{1}{4}$ $\frac{x}{7}=\frac{5}{8}$

$\frac{y}{7}=\frac{5}{8}$ y = $\frac{35}{8}$ z = $2\frac{5}{8}$

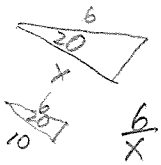
8.

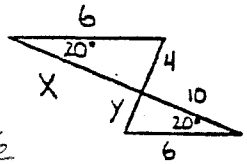


$\frac{4}{x}=\frac{7}{14}$ $\frac{4}{3}=\frac{6}{y}$

x = 8 y = $\frac{9}{2}$

9.

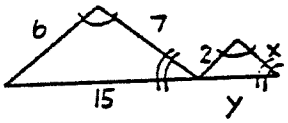




$\frac{6}{x}=\frac{6}{10}$ $\frac{6}{6}=\frac{4}{y}$

x = 10 y = 4

10.



$\frac{6}{2}=\frac{7}{x}$ $\frac{6}{2}=\frac{15}{y}$

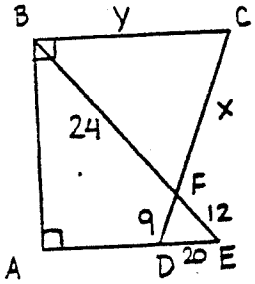
$6x=14$

$x=\frac{7}{3}$

x = $\frac{7}{3}$ y = 5

ABCD is a trapezoid with bases $\overline{AD}$ and $\overline{BC}$. Identify a pair of similar triangles and find x and y.

11.



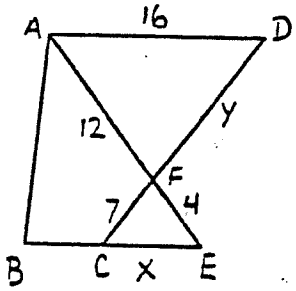
$\frac{24}{12}=\frac{y}{20}$

Similar triangles: $\triangle BFC \sim \triangle EFD$

x = 18 y = 40

$\frac{24}{12}=\frac{x}{9}$

12.



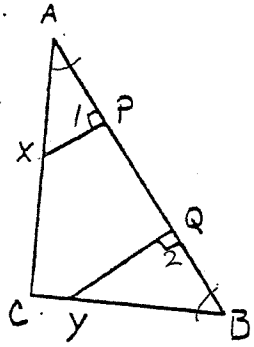
Similar triangles: $\triangle CEF \sim \triangle DAF$

x = $\frac{16}{3}$ y = 21

$\frac{12}{4}=\frac{16}{x}$ $\frac{12}{4}=\frac{y}{7}$

$12x=64$

13. Given: $\overline{AC} \cong \overline{BC}$
$\overline{XP} \perp \overline{AB}$ at P
$\overline{YQ} \perp \overline{AB}$ at Q
Prove: $\Delta XPA \sim \Delta YQB$



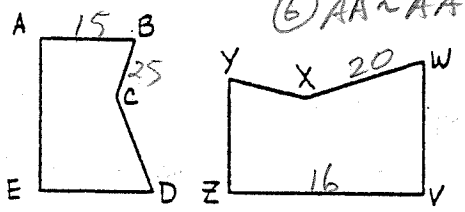
① $\overline{AC} \cong \overline{BC}$ → ② $\angle A \cong \angle B$

③ $\overline{XP} \perp \overline{AB}$ → ④ $\angle 1$ is Rt. } → ⑤ $\angle 1 \cong \angle 2$ } → ⑥ $\Delta XPA \sim \Delta YQB$
$\overline{YQ} \perp \overline{AB}$ → $\angle 2$ is Rt.

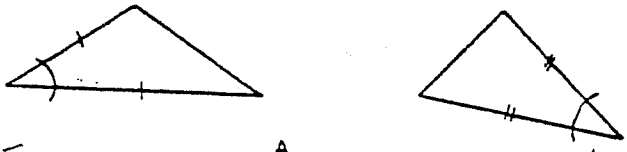
① Given
② If 2 sides ≅, ∠s opp ≅.
③ Given
④ ⊥ lines form Rt. ∠s.
⑤ All Rt ∠s ≅
⑥ AA ~ AA

14. WX = 20 AB = 15
VZ = 16 BC = 25
VWXYZ ~ ABCDE
a. The scale factor of VWXYZ to ABCDE is 5 : 4.
b. AE = 20
c. WV = 12

Scale up (got bigger)

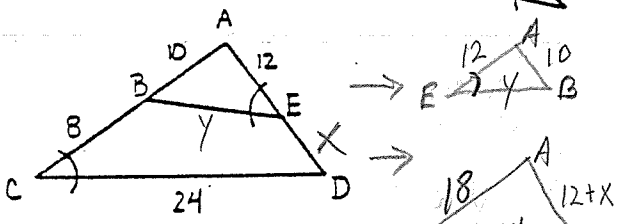


15. Decide whether these polygons are similar. Provide a brief explanation.



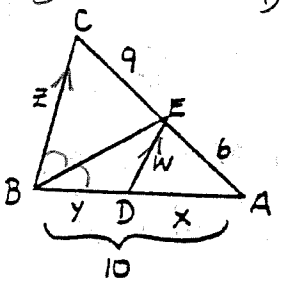
Yes, they are ~ by SAS ~ Thm. B/c 2 sides ≅ in each Δ, their ratios are = to each other.

16. AD = 15
BE = 16



$\frac{AD}{18} = \frac{10}{12+X}$

17. $\overline{DE} \parallel \overline{BC}$. $\overline{BE}$ bisects <ABC. AB = 10.
Let $y = 10 - x$



Find:

w = 6 x = 4 y = 6 z = 15

$\frac{6}{9} = \frac{x}{10-x}$
$9x = 60 - 6x$
$15x = 60$
$x = 4$

18. Use the proportion $\frac{r-t}{t} = \frac{s-u}{u}$ to complete the proportion

ex: $\frac{5-2}{2} = \frac{15-6}{6}$

$\frac{r-2t}{t} = \frac{s-2u}{u}$ $\quad \frac{r-t-t}{t} = \frac{s-u-u}{u}$ $\quad \frac{5-2-2}{2} = \frac{15-6-6}{6}$

19. A blueprint is drawn to the scale of $\frac{1}{4}$ in. to 8 feet. A wall is represented on the blueprint by a length of 3.5 in. If it costs \$36 per foot to build a wall, find the total cost to build the wall.

$\frac{1}{4}$ in = 8 feet

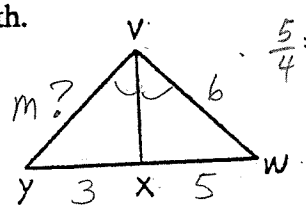
1 in = 32 feet

(3.5) 1 in = 32(3.5)

= 112 feet × 36 =

\$4032

20. In ΔVWY, $\overline{VX}$ bisects <YVW. Find the indicated length.



$\frac{5}{4} = \frac{15}{12} = \frac{8}{?}$

5? = 32

? = $\frac{32}{5}$

a. If VY = 15, VW = 12 and YX = 8, find XW.
XW = $\frac{32}{5} = 6\frac{2}{5}$

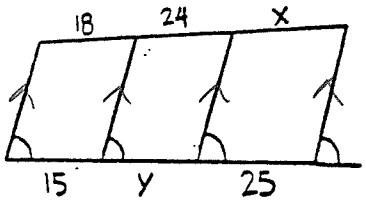
b. If YX = 3, XW = 5, and VW = 6, find VY.
VY = $\frac{18}{5}$

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

$5m = 18 \rightarrow \boxed{m = \frac{18}{5}}$

21. Use the picture below.

x = 30 y = 20



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

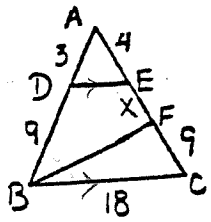
y = 20

$\frac{24}{x} = \frac{20}{25}$

x = 30

22. $\overline{DE} \parallel \overline{BC}$

x = 3



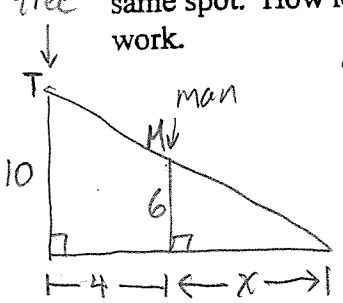
$\frac{3}{9} = \frac{4}{9+x}$ x = 3

Show $\overline{BF}$ is not the < bisector.
(HINT: Assume it is and find x!)

$\frac{12}{8} = \frac{4+x}{9}$

$x = 9\frac{1}{2}$. Since $x \neq 9$: $\overline{BF}$ is not the < bisector

23. A 6 foot tall man is standing 4 feet away from a 10 foot tall tree. The sun is shining so that the end of the man's shadow and the end of the tree's shadow are at exactly the same spot. How long is the man's shadow? Please include a diagram to show your work.



x = man's shadow length

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

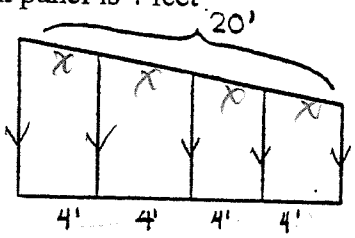
$10x = 6x + 24$

$4x = 24$

$x = 6$

Man's shadow is 6 feet.

24. Paneling is put up as shown in a room with a slanted ceiling. Each panel is 4 feet wide.



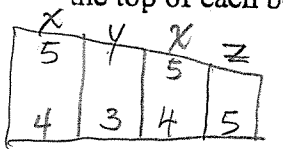
a. Find the length along the top of each panel.

$\frac{4}{16} = \frac{x}{20}$

$x = 5$

Each panel is 5 feet.

b. If the panels were of differing widths, 4 ft, 3 ft, 4 ft, and 5 ft, what would the length of the top of each be?

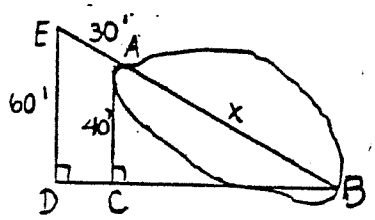


$\frac{x}{20} = \frac{4}{16}$ $\quad x = 5$

$\frac{5}{4} = \frac{y}{3}$ $\quad y = \frac{15}{4}$

$\frac{z}{5} = \frac{20}{16}$ $\quad z = \frac{100}{16} = \frac{25}{4}$

25. To find the distance x between points A and B, a surveyor located points C, D and E through direct measurement. Find the distance x.



$\frac{x}{40} = \frac{x+30}{60}$

$60x = 40x + 1200$

$20x = 1200$

$\boxed{x = 60'}$