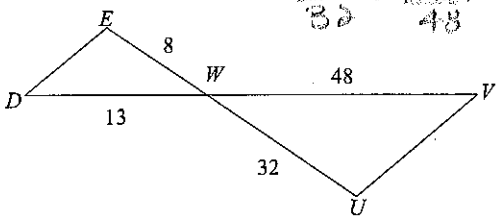
GSE Geometry Name _____

3.3 - Practice

Date _____

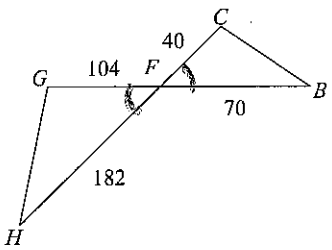
Decide if the triangles in each pair are similar.
If so, state how you know they are similar by SSS~, SAS~, or AA~. Show all work.

1) $\frac{8}{32} = \frac{13}{48}$



$\triangle WVU \sim \triangle NS \sim$

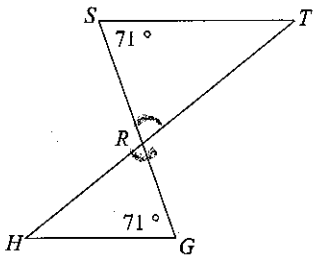
2) $\frac{104}{40} = \frac{182}{70}$



$7280 = 7280$ ✓

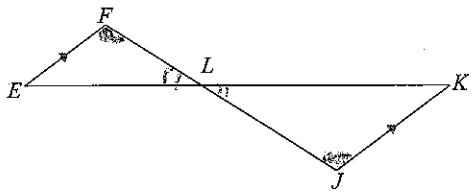
$\triangle FGH \sim \triangle FCB$ SAS~

3)



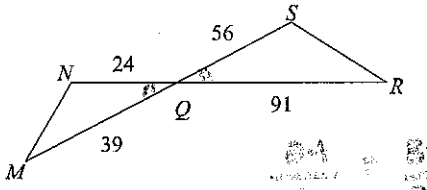
$\triangle RST \sim \triangle RGH$ AA~

4)



$\triangle LKJ \sim \triangle LEF$ AA~

5)

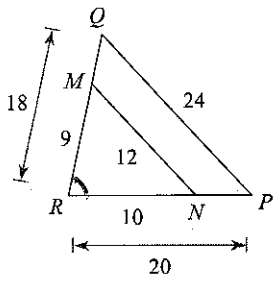


$\frac{84}{56} = \frac{91}{91}$

$\triangle QRS \sim \triangle NS \sim$

$2184 = 96$

6)

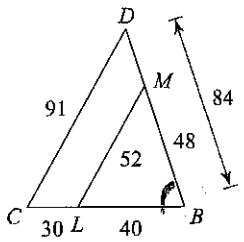


$\frac{9}{12} = \frac{18}{24}$

$216 = 216$ ✓

$\triangle RQP \sim \triangle RMN$ SAS~

7)



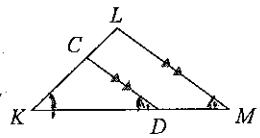
$\frac{48}{52} = \frac{84}{91}$

$\triangle BCD \sim \triangle BLM$

SAS~

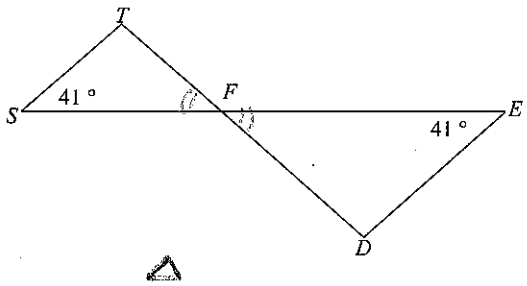
$4368 = 4368$

8)



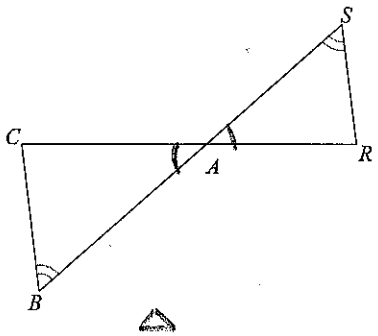
$\triangle KLM \sim \triangle KCD$ AA~

9)



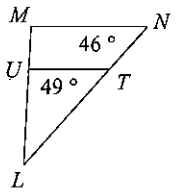
$\triangle FED \sim \triangle FST$ AA~

10)



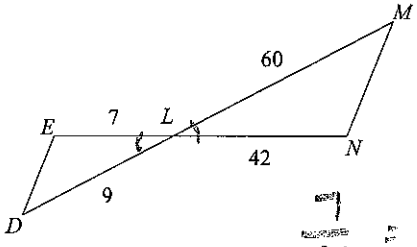
$\triangle ABC \sim \triangle ASR$ AA~

11)



$\triangle LMN \sim \triangle NSU$

12)

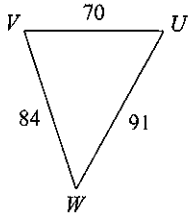


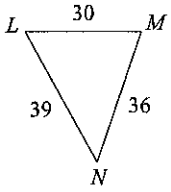
$\frac{7}{42} = \frac{9}{60}$

$420 \neq 378$

$\triangle LMN \sim \triangle NSU$

13)



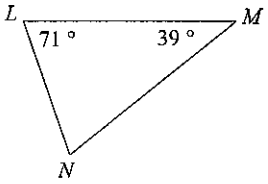


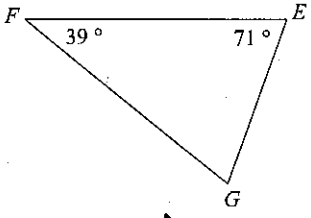
$\frac{70}{30} = \frac{84}{39} = \frac{91}{35}$

$\frac{7}{3} = \frac{7}{3.25} = \frac{7.58}{3}$

$\triangle UVW \sim \triangle NSU$

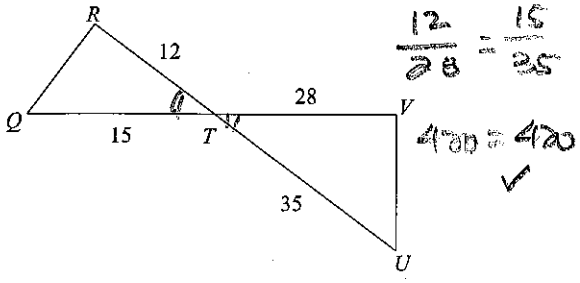
14)





$\triangle EFG \sim \triangle LMN$ AA~

15)

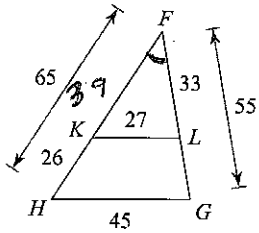


$\frac{12}{28} = \frac{15}{35}$

$420 = 420$ ✓

$\triangle TUV \sim \triangle TQR$ SAS~

16)



$\frac{33}{27} = \frac{55}{45}$

$1485 = 1485$ ✓

$\frac{39}{27} = \frac{65}{45}$

$1755 = 1755$ ✓

$\triangle FGH \sim \triangle FLK$

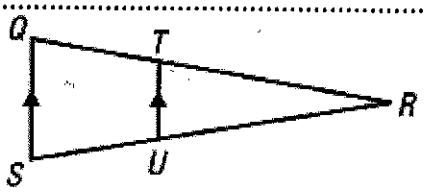
SAS~

SSS~

6.6: Proportions in Similar Triangles

Theorem 6.4: **Triangle Proportionality Theorem**

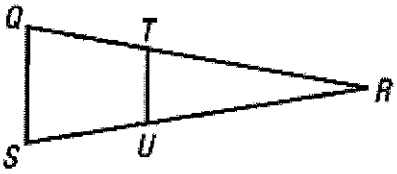
If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.



If $\overline{TU} \parallel \overline{QS}$, then $\frac{RT}{TQ} = \frac{RU}{US}$.

Theorem 6.5: **Converse of the Triangle Proportionality Theorem**

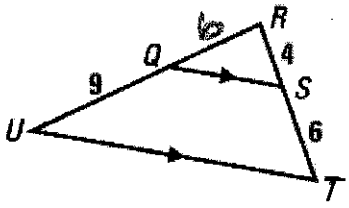
If a line divides two sides of a triangle proportionally, then it is parallel to the third side.



If $\frac{RT}{TQ} = \frac{RU}{US}$, then $\overline{TU} \parallel \overline{QS}$.

Practice Theorems 6.4-6.5:

1.) In the diagram, $\overline{QS} \parallel \overline{UT}$, RS = 4, ST = 6, and QU = 9. What is the length of $\overline{RQ}$?

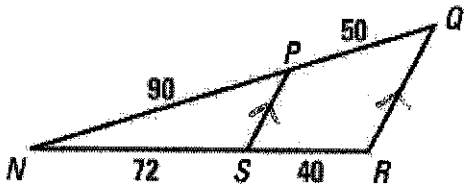


$\frac{4}{x} = \frac{6}{9}$

$36 = 6x$

$6 = x$

2.) Determine whether $\overline{PS} \parallel \overline{QR}$.

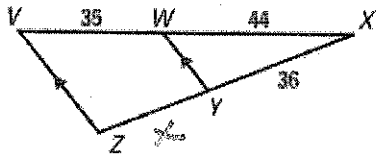


$\frac{90}{72} = \frac{50}{40}$

$3600 = 3600$ ✓

On your Own:

a. Find the length of $\overline{YZ}$.

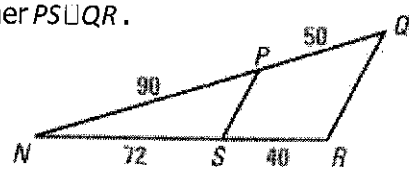


$\frac{36}{x} = \frac{44}{35}$

$44x = 1260$

$x = 28.64$

b. Determine whether $\overline{PS} \parallel \overline{QR}$.

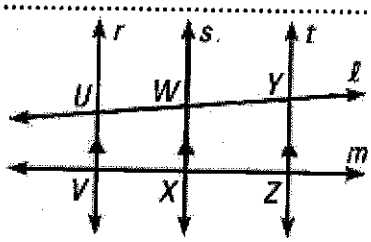


$\frac{90}{72} = \frac{50}{40}$

$3600 = 3600$ ✓

Theorem 6.6

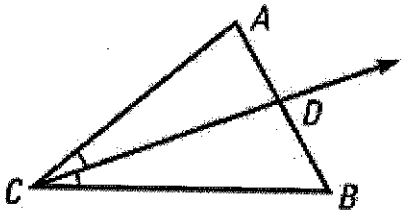
If three parallel lines intersect two transversals, then they divide the transversals proportionally.



$$\frac{UW}{WY} = \frac{VX}{XZ}$$

Theorem 6.7

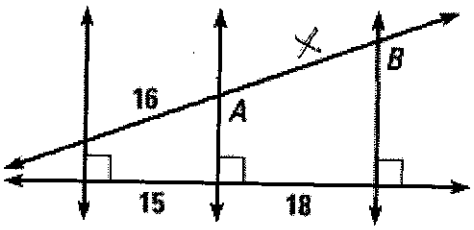
If a ray bisects an angle of a triangle, then it divides the opposite side into segments whose lengths are proportional to the lengths of the other two sides.



$$\frac{AD}{DB} = \frac{CA}{CB}$$

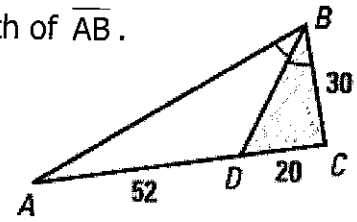
Practice Theorems 6.6-6.7:

3.) Find the length of $\overline{AB}$.



$\frac{16}{15} = \frac{x}{18}$ $15x = 288$ $x = 19.2$

4.) Find the length of $\overline{AB}$.

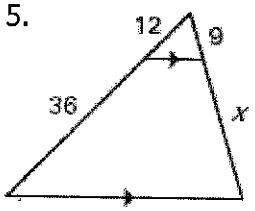


$\frac{30}{20} = \frac{x}{72}$ $x = 108$

$20x = 2160$

Use the diagrams to find the value of each variable.

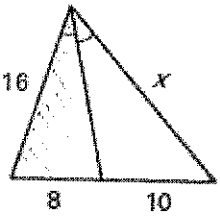
5.



$\frac{12}{9} = \frac{36}{x}$ $x = 27$

$12x = 324$

6.

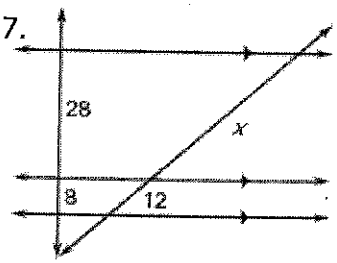


$\frac{16}{8} = \frac{x}{10}$

$160 = 8x$

$20 = x$

7.

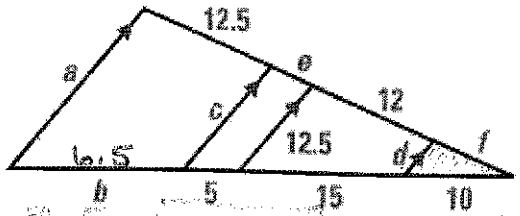


$\frac{8}{12} = \frac{28}{x}$

$8x = 336$

$x = 42$

8.



$\frac{25}{12.5} = \frac{30+6}{25}$ $a = 18.25$

$\frac{10}{d} = \frac{25}{12.5}$

$125 = 25d$

$5 = d$

$\frac{10}{f} = \frac{15}{12}$

$120 = 15f$

$8 = f$

$\frac{25}{12.5} = \frac{30}{c}$

$25c = 375$

$c = 15$

$\frac{25}{30} = \frac{20}{20+e}$

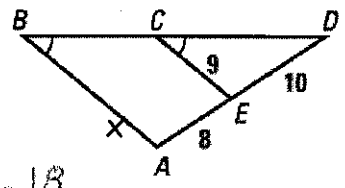
$600 = 500 + 25e$

$\frac{100}{25} = \frac{25e}{25}$

$4 = e$

Mixed Practice (Theorems 6.4-6.7)

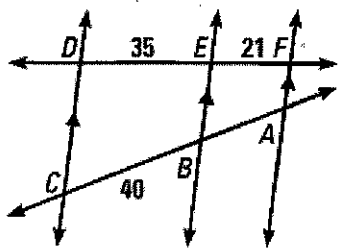
#9-13: Use the diagram to find the value of each variable.

9.) 

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

$10x = 162$

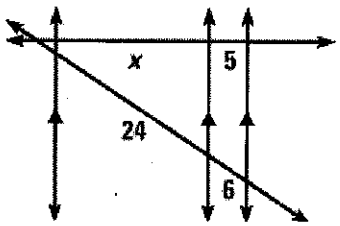
$x = 16.2$

10.) 

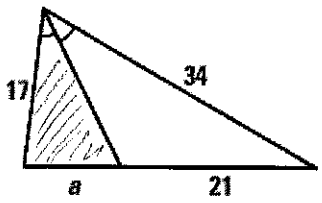
$\frac{21}{x} = \frac{35}{40}$

$35x = 840$

$x = 24$

11.) 

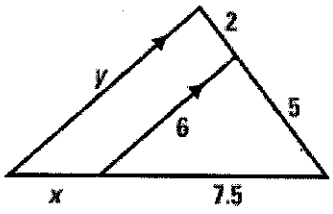
$\frac{5}{x} = \frac{6}{24}$ $6x = 120$ $x = 20$

12.) 

$\frac{17}{a} = \frac{34}{21}$

$357 = 34a$

$10.5 = a$

13.) 

$\frac{5}{6} = \frac{7}{y}$ $5y = 42$ $y = 8.4$

$\frac{5}{7} = \frac{7.5}{7.5+x}$

$52.5 = 37.5 + 5x$

$15 = 5x$

$3 = x$

#14-17: Determine the length of each segment.

14.) $\overline{AG}$ $\frac{4}{x} = \frac{10}{4+x}$ $16 = 6x$ $2.67 = x$

$16 + 4x = 10x$

15.) $\overline{FC}$ $\frac{4}{3} = \frac{10}{y}$ $4y = 30$ $y = 7.5$

16.) $\overline{ED}$ $\frac{4}{3\frac{1}{2}} = \frac{15}{x}$

$4x = 45$

$x = 11.25$

17.) $\overline{AE}$ $\frac{10}{6.67} = \frac{15}{6.67+w}$

$10(6.67 + w) = 15(6.67 + w)$

$66.7 + 10w = 100.05 + 15w$

$-33.35 = 5w$

$-6.67 = w$