Name: _____ Class: _____ Date: _____ ID: A

Honors Geometry - Ch. 7 Test (Similarity)

_____ 1. A model is made of a car. The car is ~~10 feet long~~ *120 in* and the model is 7 inches long. What is the ratio of the length of the car to the length of the model?

   A. $10:7$ B. $7:120$ C. $120:7$ D. $7:10$

_____ 2. The measure of two complementary angles are in the ratio $1:5$. What are the degree measures of the two angles?

   A. ~~36° and 144°~~
   B. 15° and 75°
   C. 30° and 150°
   D. 18° and 72°

   $\frac{90}{1+5} = \frac{90}{6} = 15$
   $15 \cdot 1 = 15$
   $15 \cdot 5 = 75$

_____ 3. The measures of the angles of a triangle are in the extended ratio $2:3:4$. What is the measure of the smallest angle?

   A. 40
   B. 60
   C. 80
   D. 20

   $\frac{180}{2+3+4} = \frac{180}{9} = 20$
   $20 \cdot 2 = 40$

What is the solution of each proportion?

_____ 4. $\frac{4}{a} = \frac{\cancel{16}\;1}{\cancel{32}\;2}$ $a = 8$

   A. 32   B. 128   C. 8   D. 16

_____ 5. $\frac{3y-8}{12} = \frac{y}{5}$ $5(3y-8) = 12y$ $-40 = -3y$
   $15y - 40 = 12y$

   A. −10   B. −7   C. $\frac{3}{40}$ D. $\frac{40}{3}$

_____ 6. Given the proportion $\frac{a}{b} = \frac{5}{19}$, what ratio completes the equivalent proportion $\frac{a}{5} = \frac{b}{19}$?

   A. $\frac{a}{19}$
   B. $\frac{b}{19}$
   C. $\frac{5}{19}$
   D. $\frac{19}{b}$

1

_____ 7. $ABCDE \sim GHJDF$. Complete the statements.
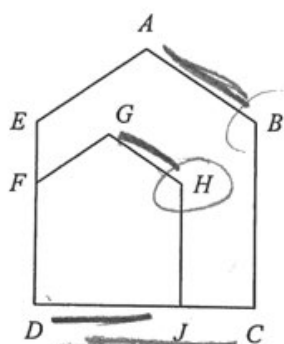
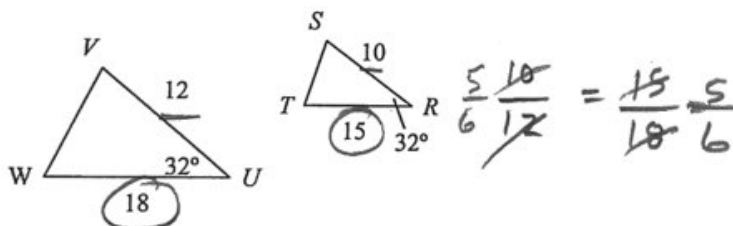a. $\angle H \cong$ ■

b. $\dfrac{GH}{DJ} = \dfrac{AB}{■}$ DC

A. $\angle B$; DC B. ~~E; AE~~   C. ~~E; DC~~   D. $\angle B$; AE

Are the polygons similar? If they are, write a similarity statement and give the scale factor.

Not drawn to scale.

$\dfrac{5}{6} \dfrac{10}{12} = \dfrac{15}{18} \dfrac{5}{6}$

_____ 8.

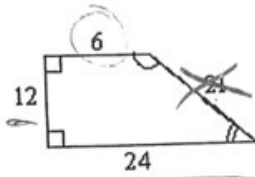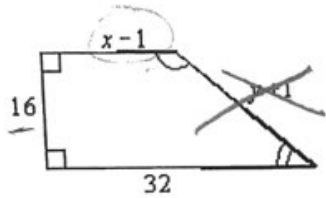A. ~~$\triangle RST \sim \triangle WUV$; $\dfrac{5}{6}$~~

B. $\triangle RST \sim \triangle UVW$; $\dfrac{5}{6}$

C. ~~$\triangle RST \sim \triangle VWU$; $\dfrac{6}{5}$~~

D. The triangles are not similar.

ame: _____

The polygons are similar, but not necessarily drawn to scale. Find the value of x.

___ 9.

A. $x = 8$

B. $x = \dfrac{11}{2}$

C. $x = 9$

D. $x = 10$

$$\dfrac{x-1}{6} = \dfrac{16}{12} \quad \dfrac{4}{3}$$

$$3(x-1) = 24$$

$$3x - 3 = 24$$

$$3x = 27$$
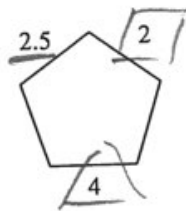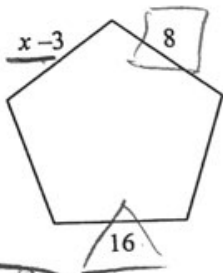
___ 10.

A. $x = 13$

B. $x = 7$

C. $x = 5.5$

D. $x = 10$

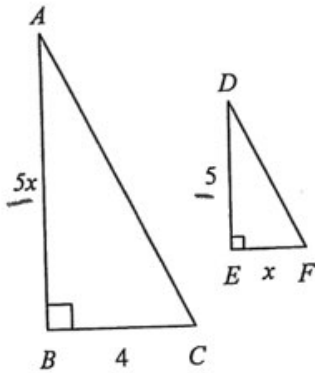$$\dfrac{x-3}{2.5} = \dfrac{8}{2} \quad \dfrac{4}{1}$$

$$x - 3 = 10$$

$$\dfrac{5x}{81} = \dfrac{4}{x}$$

$$x^2 = 4$$

___ 11.

A. 1

B. 2

C. 4

D. 20

___ 12. You want to draw an enlargement of a design that is printed on a card that is 5 in. by 6 in. You will be drawing this design on an piece of paper that is $8\frac{1}{2}$ in. by 11 in. What are the dimensions of the largest complete enlargement you can make?

A. $1\frac{2}{3}$ in. by $4\frac{1}{5}$ in.

B. $8\frac{1}{2}$ in. by $4\frac{1}{5}$ in.

C. $8\frac{1}{2}$ in. by $10\frac{1}{5}$ in.

D. $1\frac{2}{3}$ in. by $10\frac{1}{5}$ in.

$$\dfrac{8.5}{5} = 1.7 \leftarrow \text{use smaller factor}$$

$$\dfrac{11}{6} = 1.83$$
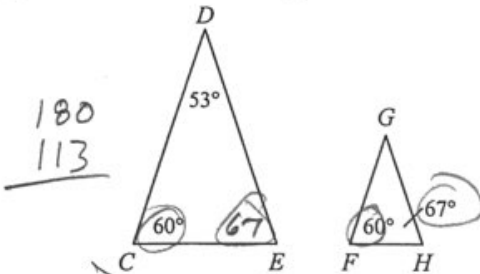
$$5 \cdot 1.7 = 8.5$$

$$6 \cdot 1.7 = 10.2$$

Name: _____

_____ 13. In a diagram of a landscape plan, the scale is 1 cm = 10 ft. In the diagram, the trees are 3.1 centimeters apart. How far apart should the actual trees be planted?
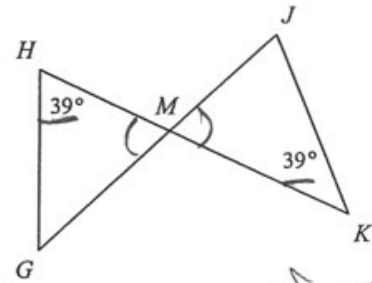
$3.1 \times 10 = 3\cancel{1}$ ft

A. 3.1 feet

C. 310 feet

B. 31 feet

D. 31 centimeters

_____ 14. Are the two triangles similar? How do you know?

180
113

A. yes, by SAS~

C. yes, by AA~

B. yes, by SSS~

D. no

_____ 15. Are the two triangles similar? How do you know?
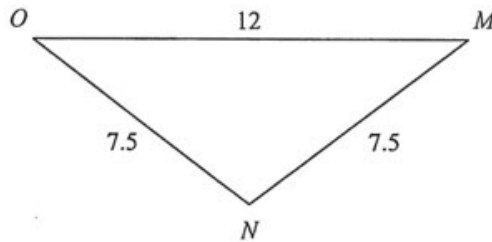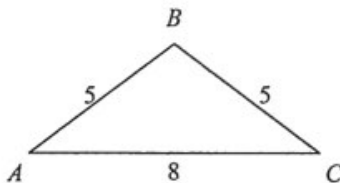

A. no   B. yes, by SSS~   C. yes, by AA~   D. yes, by SAS~

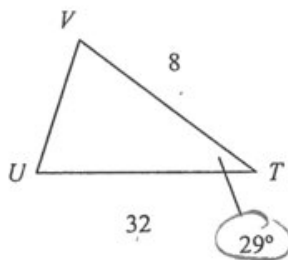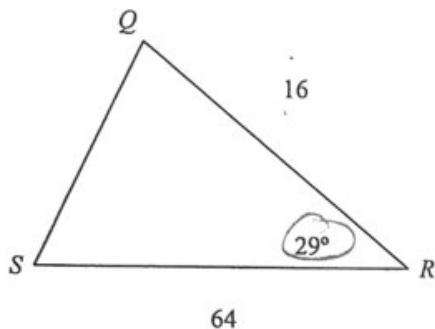**State whether the triangles are similar. If so, write a similarity statement and the postulate or theorem you used.**

_____ 16.

$\frac{5}{7.5} = \frac{8}{12}$

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

A. △ABC ~ △MNO; SSS~

C. △ABC ~ △MNO; AA~

B. △ABC ~ △MNO; SAS~

D. The triangles are not similar.

4

Triangle QSR with Q at top, S bottom left, R bottom right. Side from Q is 16, angle at R is 29°, base SR is 64.

Triangle with V at top, U bottom left, T right. VT side is 8, UT is 32, angle at T is 29°.

17. _____

~~A.   △SRQ ~ △UTV; ASA~~~   ~~C.   △RSQ ~ △TUV; ASA~~~

B.   △QRS ~ △VTU; SAS~

D.   The triangles are not similar.

18. _____ Michele wanted to measure the height of her school's flagpole. She placed a mirror on the ground 48 feet from the flagpole, then walked backwards until she was able to see the top of the pole in the mirror. Her eyes were 5 feet above the ground and she was 12 feet from the mirror. Using similar triangles, find the height of the flagpole to the nearest tenth of a foot.
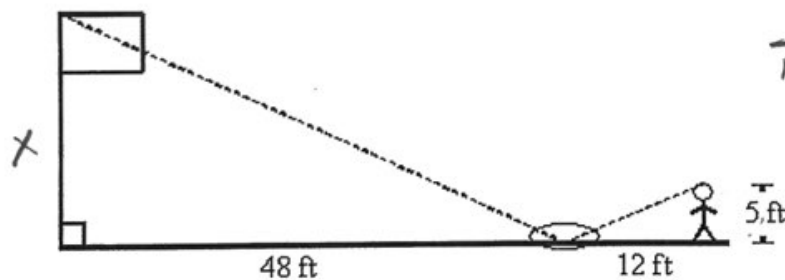
$\frac{5}{12} = \frac{x}{48}$ OR $\frac{5}{x} = \frac{12}{48} \frac{1}{4}$

$12x = 240$ $x = 20$

$x = 20$
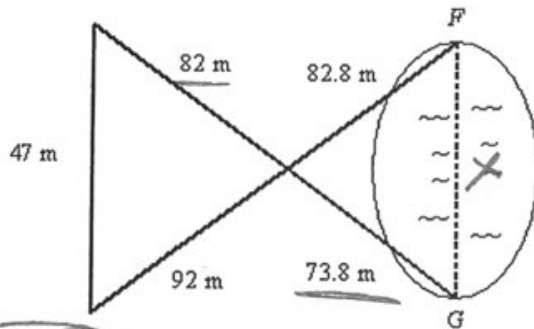
A.   20 ft   B.   38.4 ft   C.   55 ft   D.   25 ft

Name: _____

_____ 19. Campsites *F* and *G* are on opposite sides of a lake. A survey crew made the measurements shown on the diagram. What is the distance between the two campsites? The diagram is not to scale.

82 m   82.8 m

47 m

92 m   73.8 m

$\frac{x}{47} = \frac{73.8}{82}$

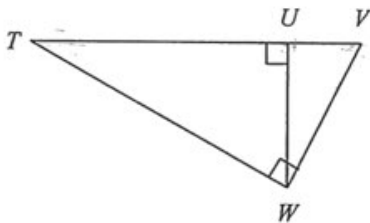$82x = 3468.6$

$x = 42.3$

   A. 42.3 m   B. 47.4 m   C. 73.8 m   D. 82.8 m

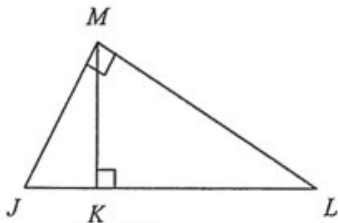**What similarity statement can you write relating the three triangles in the diagram?**

_____ 20.

   A. $\triangle UVW \sim \triangle UWT \sim \triangle WVT$ C. $\triangle WUT \sim \triangle VUW \sim \triangle WVT$
   B. $\triangle UVW \sim \triangle WUT \sim \triangle WVT$ D. $\triangle TWV \sim \triangle VUW \sim \triangle UWT$

_____ 21.

   A. $\triangle JMK \sim \triangle MLK \sim \triangle JLM$ C. $\triangle JLM \sim \triangle MLK \sim \triangle JKM$
   B. $\triangle JMK \sim \triangle LMK \sim \triangle JLM$ D. $\triangle JKM \sim \triangle MKL \sim \triangle MJL$

Find the geometric mean of the pair of numbers.

_____ 22. 4 and 7
   A. $4\sqrt{2}$ B. $2\sqrt{7}$ C. 28   D. $\sqrt{35}$
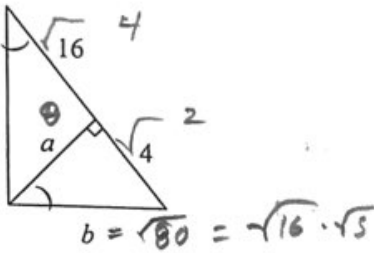
_____ 23. 81 and 4
   A. 38   B. 23   C. 28   D. 18

What are the values of *a* and *b*?

____ 24.

$16 \quad 4$

$a \quad 4 \quad 2$
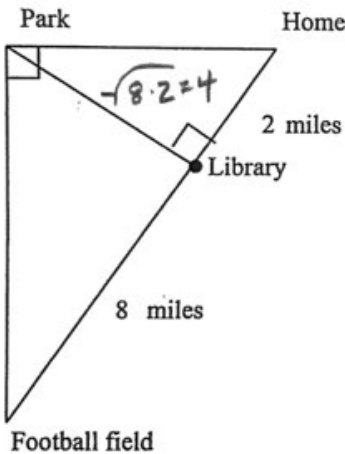
$b = \sqrt{80} = \sqrt{16} \cdot \sqrt{5}$

A. $a = 8, b = 8\sqrt{5}$

~~B. $a = 18, b = 4\sqrt{5}$~~

C. $a = 8, b = 4\sqrt{5}$

~~D. $a = 64, b = 80$~~

____ 25. Kristen lives directly east of the park. The football field is directly south of the park. The library sits on the line formed between Kristen's home and the football field at the exact point where an altitude to the right triangle formed by her home, the park, and the football field could be drawn. The library is 2 miles from her home. The football field is 8 miles from the library.

Park   Home

$\sqrt{8 \cdot 2} = 4$

2 miles

Library

$\sqrt{4^2 + 8^2} = ?$

$\sqrt{80}$

$\sqrt{16} \cdot \sqrt{5}$

8 miles

Football field

a. How far is library from the park?
b. How far is the park from the football field?
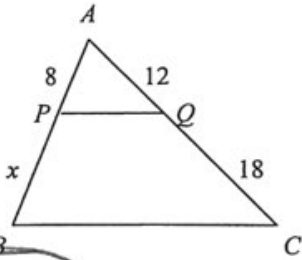
A. 4 miles; $4\sqrt{5}$ miles

~~B. $\sqrt{10}$ miles; $3\sqrt{2}$ miles~~

~~C. 5 miles; 9 miles~~

D. 4 miles; $3\sqrt{2}$ miles

7

Name: _____

_____ 26. What is the value of x, given that $\overline{PQ} \parallel \overline{BC}$?

A
8 / 12
P / Q
x / 18
B / C

$$\frac{8}{x} = \frac{\cancel{12}}{\cancel{18}} \frac{2}{3}$$

$$2x = 24$$

A. 12   B. 6   C. 20   D. 24

_____ 27. What is the value of x, given that $\overline{PQ} \parallel \overline{BC}$?

A
7 / x
P / Q
35 / 40
B / C
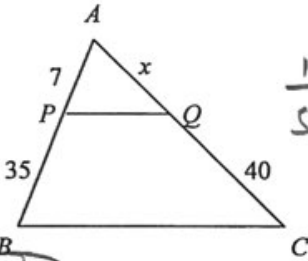
$$\frac{1}{5} \frac{\cancel{7}}{\cancel{35}} = \frac{x}{40}$$

$$5x = 40$$

A. 8   B. 11   C. 10   D. 16

_____ 28. What is value of x, given that $\overline{OP} \parallel \overline{NQ}$?

O
9
N
P
x
18 / Q
20
M
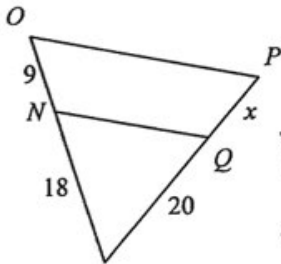
$$\frac{1}{2} \frac{\cancel{9}}{\cancel{18}} = \frac{x}{20}$$
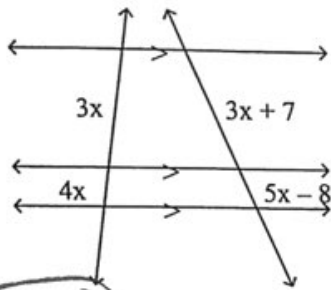
$$2x = 20$$

A. $x = 10$ C. $x = 13$
B. $x = 20$ D. $x = 25.5$

8

29. What is the value of x?

$$\frac{3x}{4x} = \frac{3x+7}{5x-8}$$
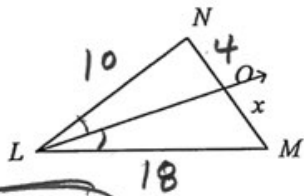
$3(5x-8) = 4(3x+7)$

$15x - 24 = 12x + 28$

$3x = 52$

A. $\frac{52}{3}$ B. $\frac{3}{4}$ C. 17   D. $\frac{52}{7}$

30. $\overrightarrow{LO}$ bisects $\angle NLM$, $LM = 18$, $NO = 4$, and $LN = 10$. What is the value of x?

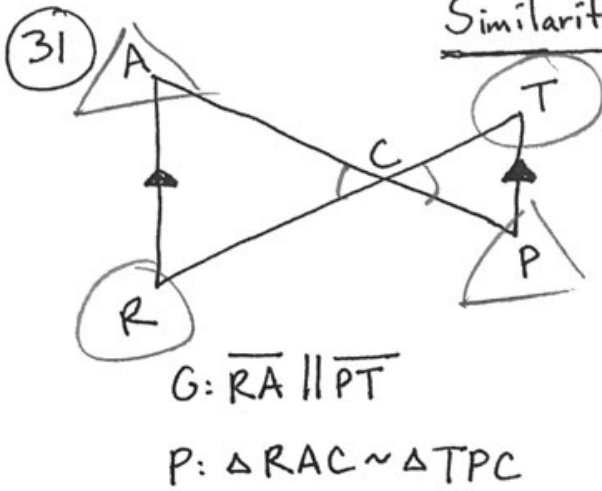$$\frac{5}{2}\frac{10}{4} = \frac{18}{x}$$

$5x = 36$

A. 7.2   B. 45   C. 5.43   D. 2.22
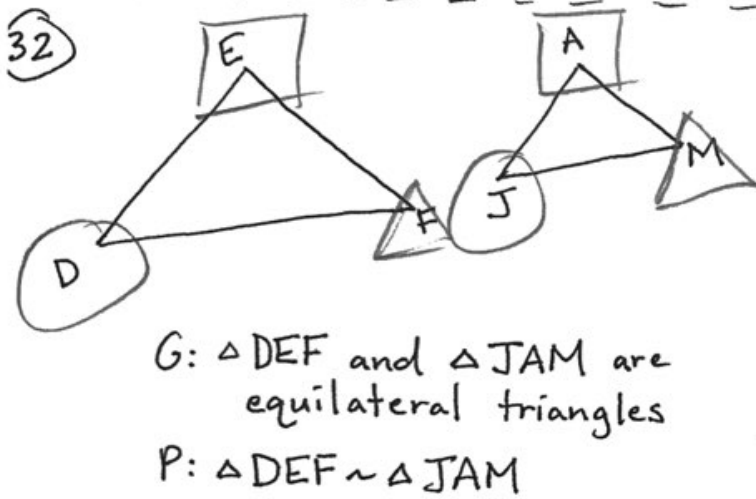
Name: _____
Period: _____ Date: _____

31.

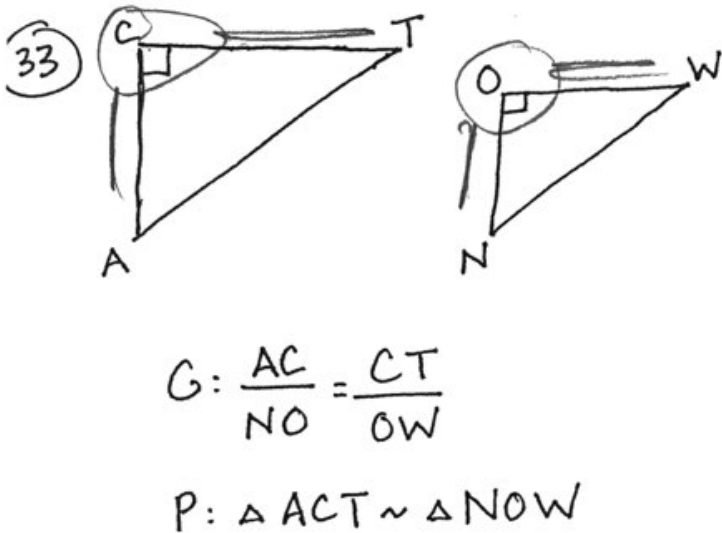G: $\overline{RA} \parallel \overline{PT}$

P: $\triangle RAC \sim \triangle TPC$

S	R	
① ☺	① Given	
② $\angle A \cong \angle P$	② Alt. Int. $\angle$'s	⊛
③ $\angle R \cong \angle T$	③ Alt. Int. $\angle$'s	Pick 2
④ $\angle ACR \cong \angle PCT$	④ Vertical $\angle$'s	of 3
⑤ $\triangle RAC \sim \triangle TPC$	⑤ AA$\sim$	

32.

G: $\triangle DEF$ and $\triangle JAM$ are equilateral triangles

P: $\triangle DEF \sim \triangle JAM$

S	R	
① ☺	① Given	
② $\angle D \cong \angle J$	②	⊛
③ $\angle E \cong \angle A$	③ Def. Eq. $\triangle$'s	Pick 2
④ $\angle F \cong \angle M$	④	of 3
⑤ $\triangle DEF \sim \triangle JAM$	⑤ AA$\sim$	

33.

G: $\dfrac{AC}{NO} = \dfrac{CT}{OW}$

P: $\triangle ACT \sim \triangle NOW$

S	R
① ☺	① Given
② $\angle C \cong \angle O$	② Def. Right $\angle$'s
③ $\triangle ACT \sim \triangle NOW$	③ SAS$\sim$
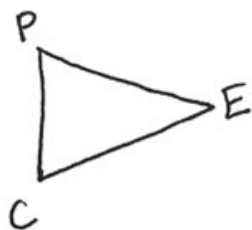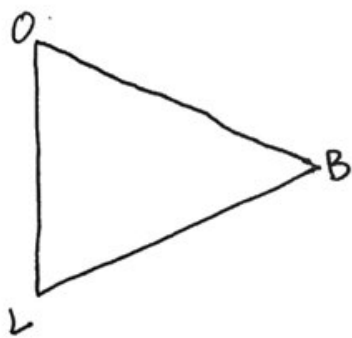
$$G: \frac{LO}{CP} = \frac{OB}{PE} = \frac{BL}{EC}$$

$$P: \triangle LOB \sim \triangle CPE$$

S	R
① ☺	① Given
② $\triangle LOB \sim$ $\triangle CPE$	② SSS $\sim$
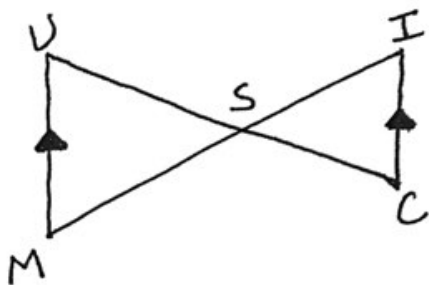
$$G: \overline{UM} \parallel \overline{IC}, \quad \frac{US}{CS} = \frac{MS}{IS}$$

$$P: \triangle MUS \sim \triangle ISC$$

S	R
① ☺	① Given
② $\angle USM \cong$ $\angle CSI$	② Vertical ∠'s
③ $\triangle MUS \sim$ $\triangle ISC$	③ SAS $\sim$

OR

S	R	
① ☺	① Given	✻
② $\angle U \cong \angle C$	② Alt. Int. ∠'s	Pick 2
③ $\angle M \cong \angle I$	③ Alt. Int. ∠'s	of 3
④ $\angle USM \cong$ $\angle CSI$	④ Vertical ∠'s	
⑤ $\triangle MUS \sim$ $\triangle ISC$	⑤ AA $\sim$	

✻ BONUS: For an additional 9 POINTS, show 3 more ways to write this proof (3 points per proof).