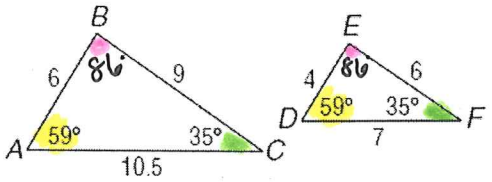
Name: Key Date: HR:

Similar Polygons HOMEWORK

Must show SLRs = and corresponding ∠s ≅

Determine if the figures are similar. Justify your reasoning as modeled in class.

1.



∠A ≅ ∠D, ∠C ≅ ∠F, ∠B ≅ ∠E

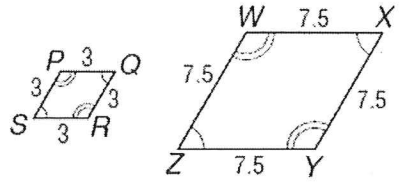
So corresponding ∠s are ≅

$\frac{AB}{DE} = \frac{6}{4} = \frac{3}{2}$, $\frac{BC}{EF} = \frac{9}{6} = \frac{3}{2}$, $\frac{AC}{DF} = \frac{10.5}{7} = \frac{3}{2}$ ✓

SLRs = and corresponding ∠s are ≅

and SLR = ∴ $\triangle ABC \sim \triangle DEF$

2.



∠P ≅ ∠W, ∠Q ≅ ∠X

∠R ≅ ∠Y, ∠S ≅ ∠Z

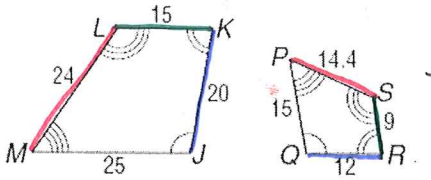
corresp. ∠s ≅

$\frac{PQ}{WX} = \frac{QR}{XY} = \frac{RS}{YZ} = \frac{SP}{ZW} = \frac{3}{7.5} = .4$ or $\frac{2}{5}$

SLRs = corresponding ∠s are ≅ & SLRs are = ∴

Rhombus PQRS ~ Rhombus WXYZ

3.



∠J ≅ ∠Q, ∠K ≅ ∠R, ∠L ≅ ∠S, ∠M ≅ ∠P

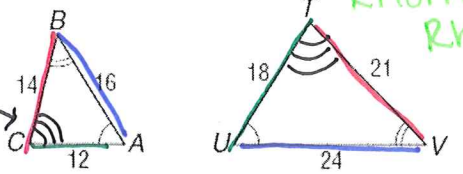
$\frac{LM}{PS} = \frac{24}{14.4} = 1.\overline{6}$, $\frac{KJ}{QR} = \frac{20}{12} = 1.\overline{6}$, $\frac{LK}{SR} = \frac{15}{9} = 1.\overline{6}$

$\frac{MJ}{PQ} = \frac{25}{15} = 1.\overline{6}$, SLRs are = and corresponding ∠s are ≅ ∴

JKLM ~ QRSP

4.

3rd ∠ thm must show 3rd ∠s are ≅.



∠A ≅ ∠U, ∠B ≅ ∠V, ∠C ≅ ∠T

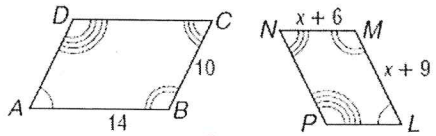
$\frac{AB}{UV} = \frac{16}{24} = \frac{2}{3}$, $\frac{BC}{TV} = \frac{14}{21} = \frac{2}{3}$, $\frac{CA}{TU} = \frac{12}{18} = \frac{2}{3}$

corresponding ∠s are ≅ and SLRs are equal ∴

$\triangle ABC \sim \triangle UVT$

Each pair of polygons is similar. Write a similarity statement, and find x, the measure(s) of the indicated side(s), and the scale factor.

5. $\overline{LM}$ and $\overline{MN}$



Similarity Statement ABCD ~ LMNP

$\frac{MN}{BC} = \frac{ML}{AB}$ $\frac{x+6}{10} = \frac{x+9}{14}$

$14(x+6) = 10(x+9)$

$14x + 84 = 10x + 90$

$4x = 6$

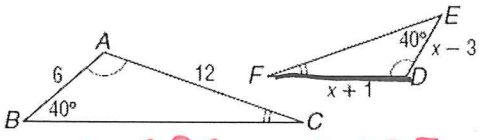
$x = \frac{6}{4} = \frac{3}{2} = 1.5$

LM = 10.5 MN = 7.5

SF: $\frac{LM}{AB}$

$SF = \frac{10.5}{14} = \frac{3}{4}$

6. $\overline{DE}$ and $\overline{DF}$



△ ABC ~ △ DEF

$\frac{FD}{AC} = \frac{ED}{AB}$ $\frac{x+1}{12} = \frac{x-3}{6}$

$6(x+1) = 12(x-3)$

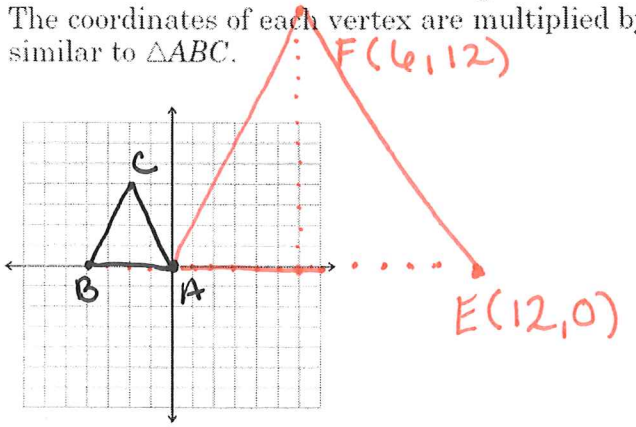
$6x + 6 = 12x - 36$

$x = 7$

DE = 4, DF = 8

$SF = \frac{DF}{AC} = \frac{8}{12} = \frac{2}{3}$

7. **COORDINATE GEOMETRY** Triangle ABC has vertices $A(0, 0)$, $B(-4, 0)$, and $C(-2, 4)$. The coordinates of each vertex are multiplied by 3 to create $\triangle AEF$. Show that $\triangle AEF$ is similar to $\triangle ABC$.



8. **NUTRITION** One ounce of cheddar cheese contains 9 grams of fat. Six of the grams of fat are saturated fats. Find the ratio of saturated fats to total fat in an ounce of cheese.

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

9. **FARMING** The ratio of goats to sheep at a university research farm is 4:7. The number of sheep at the farm is 28. What is the number of goats?

G S $\frac{4}{7} = \frac{x}{28}$

16 goats!

10. **ART** Edward Hopper's oil on canvas painting *Nighthawks* has a length of 60 inches and a width of 30 inches. A print of the original has a length of 2.5 inches. What is the width of the print?

$\frac{60}{30} = \frac{2.5}{x}$ $x = 1.25$ inches

11. The ratio of the angles of the triangle is 5:7:8. Find the measures of all three angles of the triangle.

$5x + 7x + 8x = 180$

$x = 9$

$45°, 63°, 72°$

12. The ratio of the sides of the triangle is 7:9:12 and its perimeter is 84 inches. Find the measures of all three sides of the triangle.

$7x + 9x + 12x = 84$

$28x = 84$

$x = 3$

21, 27, 36