Name ______________________ Class ____________ Date ____________

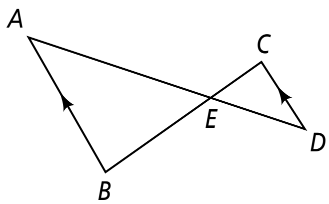
Practice

Form G

Proving Triangles Similar

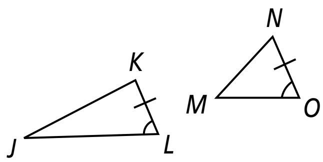
Determine whether the triangles are similar. If so, write a similarity statement and name the postulate or theorem you used. If not, explain.

1.



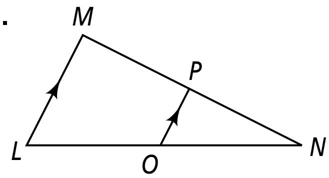
$\triangle ABE \sim \triangle DCE$ by the AA ~ Postulate

2.



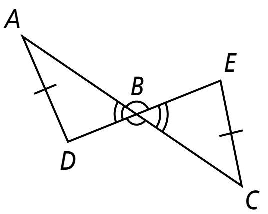
not similar; only one side and one angle ≅

3.



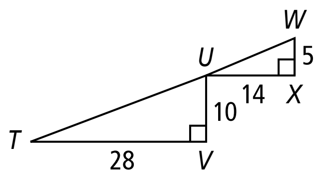
$\triangle LMN \sim \triangle OPN$ by the AA ~ Postulate

4.



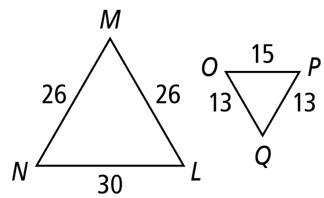
not similar; only one angle and one side ≅

5.



$\triangle TUV \sim \triangle UWX$ by the SAS ~ Theorem

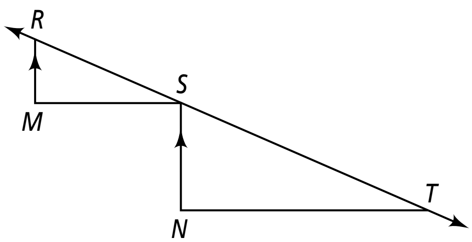
6.



$\triangle MNL \sim \triangle QOP$; SSS ~ Theorem

7. Given: $\overline{RM} \parallel \overline{SN}$, $\overline{RM} \perp \overline{MS}$, $\overline{SN} \perp \overline{NT}$

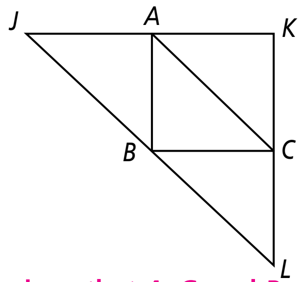
Prove: $\triangle RSM \sim \triangle STN$



Statements: 1) $\overline{RM} \parallel \overline{SN}$; $\overline{RM} \perp \overline{MS}$, $\overline{SN} \perp \overline{NT}$ 2) $\angle MRS \cong \angle NST$; 3) $\angle M$ and $\angle N$ are rt. ∆s; 4) $\angle M \cong \angle N$; 5) $\triangle RSM \sim \triangle STN$; **Reasons:** 1) Given; 2) Corresp. ∆s Post.; 3) Perp. lines form rt. ∆s; 4) All rt. ∆s are ≅; 5) AA ~ Post.

8. Given: A bisects $\overline{JK}$, C bisects $\overline{KL}$, B bisects $\overline{JL}$

Prove: $\triangle JKL \sim \triangle CBA$



It is given that *A, C,* and *B* are the midpoints of $\overline{JK}$, $\overline{KL}$, and $\overline{JL}$. Therefore, according to the Midsegment Theorem, $\overline{AB}$ is half the length of $\overline{KL}$, $\overline{BC}$ is half the length of $\overline{JK}$, and $\overline{AC}$ is half the length of $\overline{JL}$. It follows then that $\triangle JKL \sim \triangle CBA$ by the SSS ~ Theorem.

9. A 1.4-m tall child is standing next to a flagpole. The child's shadow is 1.2 m long. At the same time, the shadow of the flagpole is 7.5 m long. How tall is the flagpole? **8.75 m**

Name ______________________ Class ____________ Date ____________

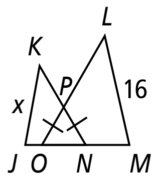
Practice (continued)

Form G

Proving Triangles Similar

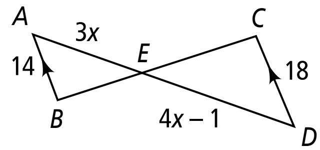
Explain why the triangles are similar. Then find the value of *x*.

10. $\overline{OP} \cong \overline{NP}$, $KN = 15$, $LO = 20$, $JN = 9$, $MO = 12$



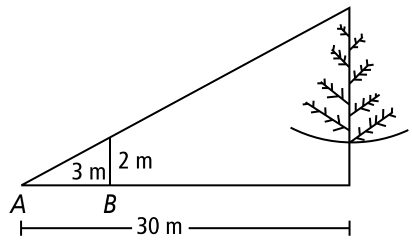
$\overline{OP} \cong \overline{NP}$ means that $\angle PON \cong \angle PNO$ because if two sides of a △ are ≅, the ⦞ opposite those sides are ≅. $\frac{KN}{LO} = \frac{15}{20} = \frac{3}{4}$ and $\frac{JN}{MO} = \frac{9}{12} = \frac{3}{4}$. So, △*JKN* ~ △*MLO* by SAS ~ Thm. $\frac{x}{16} = \frac{3}{4}$; 12

11.

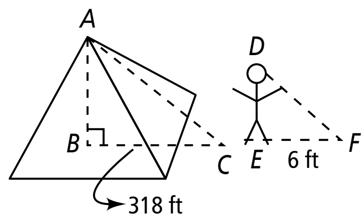


△*ABE* ~ △*DCE* by the AA ~ Post. $\overline{AB} \parallel \overline{CD}$ means that $\angle A \cong \angle D$ by the Alt. Int. ⦞ Thm. For the same reason, $\angle B \cong \angle C$. $\frac{3x}{4x - 1} = \frac{14}{18}$; 7

12. A stick 2 m long is placed vertically at point *B*. The top of the stick is in line with the top of a tree as seen from point *A*, which is 3 m from the stick and 30 m from the tree. How tall is the tree? **20 m**

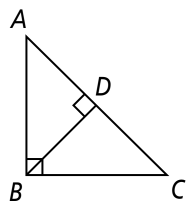


13. Thales was an ancient philosopher familiar with similar triangles. One story about him says that he found the height of a pyramid by measuring its shadow and his own shadow at the same time. If the person is 5-ft tall, what is the height of the pyramid in the drawing? **265 ft**



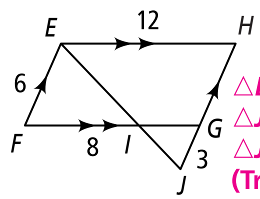
Identify the similar triangles in each figure. Explain.

14.



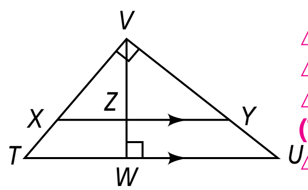
△*ADB* ~ △*ABC* (AA ~);
△*BDC* ~ △*ABC* (AA ~);
△*ADB* ~ △*BDC*
(Trans. Prop. of ~ △s)

15.



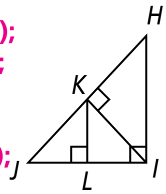
△*EIF* ~ △*JIG* (AA ~);
△*JIG* ~ △*JEH* (AA ~);
△*JEH* ~ △*EIF*
(Trans. Prop. of ~ △s)

16.



△*TUV* ~ △*VUW* (AA ~);
△*TUV* ~ △*XYV* (AA ~);
△*VUW* ~ △*XYV*
(Trans. Prop. of ~△s);
△*TUV* ~ △*TVW* (AA ~);
△*TVW* ~ △*VUW* (Trans. Prop. of ~△s); △*TVW* ~ △*XYV* (Trans. Prop. of ~△s); △*XVZ* ~ △*TVW* (AA ~); △*VYZ* ~ △*VUW* (AA ~); △*VYZ* ~ △*XYV* (AA ~); △*XVZ* ~ △*XYV* (AA ~); △*VYZ* ~ △*XVZ* (Trans. Prop. of ~△s); △*TUV* ~ △*VYZ* (Trans. Prop. of ~△s); △*TUV* ~ △*XVZ* (Trans. Prop. of ~△s); △*TVW* ~ △*VYZ* (Trans. Prop. of ~△s); △*VUW* ~ △*XVZ* (Trans. Prop. of ~△s)

17.



△*JKL* ~ △*JHI* (AA ~);
△*JKL* ~ △*JIK* (AA ~);
△*JIK* ~ △*KIL* (AA ~);
△*IHK* ~ △*JHI* (AA ~);
△*IHK* ~ △*JKL* ~ △*JIK* ~ △*KIL* ~ △*JHI* (Trans. Prop. of ~△s)