

# Geometry

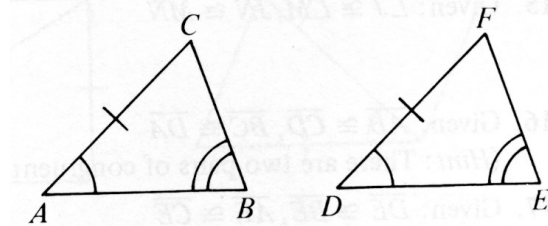
## Triangle Congruence Investigation<sup>1</sup>

### Goals

I understand more fully what is needed to show that two triangles are congruent.

1. Given  $\angle A \cong \angle D$ ,  $\angle B \cong \angle E$ ,  $\overline{AC} \cong \overline{DF}$

- a. Express the measure of  $\angle C$  in terms of the measures of  $\angle A$  and  $\angle B$ .



- b. Express the measure of  $\angle F$  in terms of the measures of  $\angle D$  and  $\angle E$ .

- c. Is  $\angle C \cong \angle F$ ? Why?

- d. Is  $\triangle ABC \cong \triangle DEF$ ? Why?

- e. If two angles and a non-included side of one triangle are congruent to the corresponding parts of a second triangle, must the triangles be congruent? Explain.  
(words  $\geq 20$ )

- f. What would happen if the word “corresponding” was removed from the statement in (e) above?

<sup>1</sup> Unified Math Book 2, G. Rising

## Triangle Congruence Investigation

2. Given:  $\overline{RS} \parallel \overline{XY}$ ,  $RS = 11$ ,  $XY = 18$

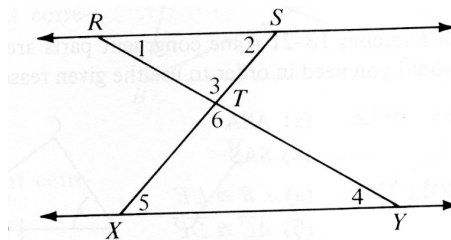
a. What angle shown is congruent to  $\angle 1$ ? Why?

b. What angle shown is congruent to  $\angle 2$ ?

c. What angle shown is congruent to  $\angle 3$ ? Why?

d. Are  $\triangle RST$  and  $\triangle YXT$  congruent? Explain.

e. If three angles of one triangle are congruent to three angles of another triangle, must the two triangles be congruent? Explain. (words  $\geq 20$ )



3. Using the drawing of  $\triangle DEF$  shown,

a. Construct  $\overline{XR}$  so that  $\overline{XR}$  is congruent to  $\overline{DE}$ .

b. Construct  $\angle RXY$  congruent to  $\angle D$ .

c. Open your compass to radius  $EF$ . With R as the center, draw an arc of radius  $EF$  intersecting  $\overline{XY}$  in two points, S and T. Draw  $\overline{RS}$  and  $\overline{RT}$ .

d. List the congruent corresponding parts of  $\triangle DEF$  and  $\triangle XRS$ .

e. List the congruent parts of  $\triangle DEF$  and  $\triangle XRT$ .

f. Is  $\triangle DEF$  congruent to both  $\triangle XRS$  and  $\triangle XRT$ ?

g. If two sides and a non-included angle of one triangle are congruent to the corresponding parts of a second triangle, must the triangles be congruent? Explain. (words  $\geq 20$ )

