Explorations

These exploratory exercises can be done using a computer with a program that draws and measures geometric figures.

1. Draw any triangle ABC. Choose a point D on $\overline{AB}$. Draw a line through D parallel to $\overline{BC}$ and intersecting $\overline{AC}$ at point E.
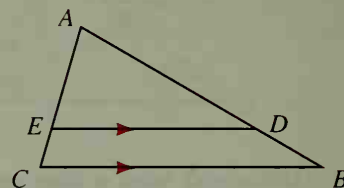
   What do you know about $\triangle ABC$ and $\triangle ADE$?

   What do you know about $\dfrac{AE}{AC}$ and $\dfrac{AD}{AB}$?

   Calculate $\dfrac{AE}{EC}$ and $\dfrac{AD}{DB}$. What do you notice?

   Calculate $\dfrac{EC}{AC}$ and $\dfrac{DB}{AB}$. What do you notice?
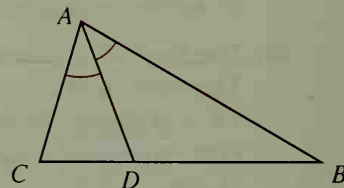
   Repeat on other triangles. What do you notice?

2. Draw any triangle ABC. Draw the bisector of $\angle A$ intersecting $\overline{CB}$ at point D.

   Measure and record the four lengths: AB, AC, BD, DC.

   Calculate $\dfrac{BD}{DC}$ and $\dfrac{AB}{AC}$. What do you notice?

   Repeat on other triangles. What do you notice?

Mixed Review Exercises

Complete.

1. Given: $\overline{AF} \parallel \overline{BE} \parallel \overline{CD}$; $\overline{AB} \cong \overline{BC}$
   a. $\overline{GF} \cong$ __?__ and $\overline{ED} \cong$ __?__
   b. If $AB = 9$, then $AC =$ __?__.
   c. If $FG = 3x + 2$ and $GC = 7x - 10$, then $x =$ __?__.
   d. $m \angle FEG =$ __?__

2. Given: W and U are the midpoints of $\overline{RV}$ and $\overline{VT}$; $\overline{SW} \parallel \overline{VT}$
   a. S is the __?__ of $\overline{RT}$ and $\overline{SU} \parallel$ __?__.
   b. If $TV = 12x + 4$ and $SW = 3x + 8$, then $x =$ __?__.
   c. If $RW = 4y + 1$ and $SU = 9y - 19$, then $y =$ __?__.