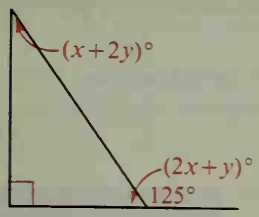
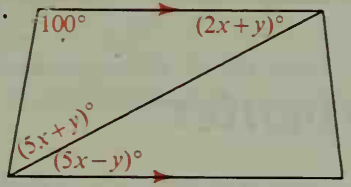
Find the values of x and y.

29.

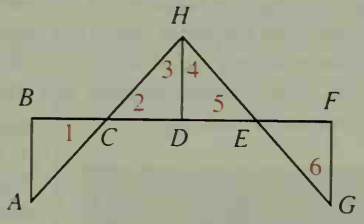


30.



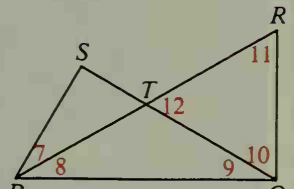
31. Given: $\overline{AB} \perp \overline{BF}$; $\overline{HD} \perp \overline{BF}$; $\overline{GF} \perp \overline{BF}$; $\angle A \cong \angle G$

Which numbered angles must be congruent?



C **32.** Given: $\overrightarrow{PR}$ bisects $\angle SPQ$; $\overline{PS} \perp \overline{SQ}$; $\overline{RQ} \perp \overline{PQ}$

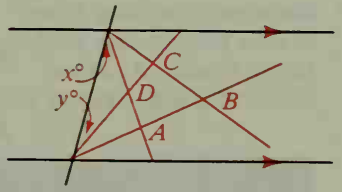
Which numbered angles must be congruent?



Ex. 32

33. **a.** Draw two parallel lines and a transversal.
b. Use a protractor to draw bisectors of two same-side interior angles.
c. Measure the angles formed by the bisectors. What do you notice?
d. Prove your answer to part (c).

34. A pair of same-side interior angles are *trisected* (divided into three congruent angles) by the red lines in the diagram. Find out what you can about the angles of $ABCD$.



Explorations

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

Decide if the following statements are true or false. If you think the statement is true, give a convincing argument to support your belief. If you think the statement is false, make a sketch and give all the measurements of the triangle that you find as your counterexample. For each false statement, also discover if there are types of triangles for which the statement is true.

1. The measure of an exterior angle is greater than the measure of any interior angle of a triangle.
2. An exterior angle is always an obtuse angle.
3. An exterior angle and some interior angle are supplementary.
4. The sum of the measures of an exterior angle and the remote interior angles is 180.