Classroom Exercises

Complete each statement with the word *always*, *sometimes*, **or** *never*.

1. If a triangle is isosceles, then it is __?__ equilateral.
2. If a triangle is equilateral, then it is __?__ isosceles.
3. If a triangle is scalene, then it is __?__ isosceles.
4. If a triangle is obtuse, then it is __?__ isosceles.

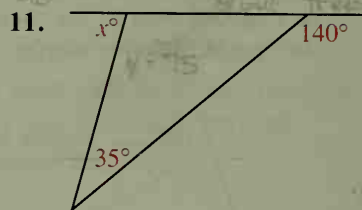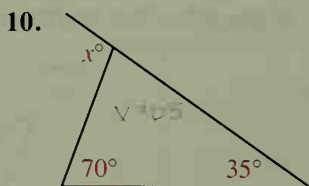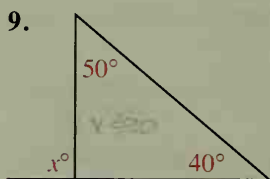**Explain how each corollary of Theorem 3-11 follows from the theorem.**
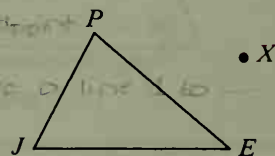
5. Corollary 1   6. Corollary 2   7. Corollary 3   8. Corollary 4

Find the value of *x*.

9.

10.

11.

What is wrong with each of the following instructions?

12. Draw the bisector of $\angle J$ to the midpoint of $\overline{PE}$.
13. Draw the line from P perpendicular to $\overline{JE}$ at its midpoint.
14. Draw the line through P and X parallel to $\overleftrightarrow{JE}$.
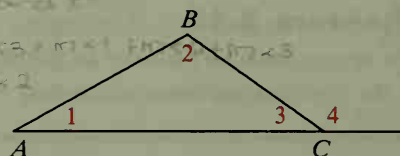

15. In the diagram you know that
    (1) $m\angle 1 + m\angle 2 + m\angle 3 = 180$
    (2) $m\angle 3 + m\angle 4 = 180$
    Explain how these equations allow you
    to prove Theorem 3-12.

16. Fold a corner of a sheet of paper and then cut along the fold to get a right triangle. Let the right angle be $\angle C$. Fold each of the other two vertices so that they coincide with point C. What result of this section does this illustrate?

17. Cut out any large $\triangle XYZ$. (If the triangle has a longest side, let that side be $\overline{YZ}$.) Fold so that X lies on the fold line and Y falls on $\overrightarrow{YZ}$. Let P be the intersection of $\overline{YZ}$ and the fold line. Unfold. Now fold the paper so that Y coincides with P. Fold it twice more so that both X and Z coincide with P. What result of this section does this illustrate?