Classroom Exercises

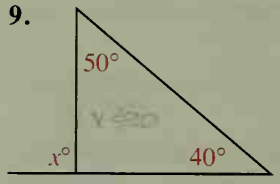
Complete each statement with the word *always*, *sometimes*, or *never*.

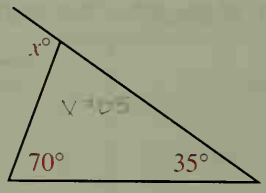
1. If a triangle is isosceles, then it is ___?___ equilateral.
2. If a triangle is equilateral, then it is ___?___ isosceles.
3. If a triangle is scalene, then it is ___?___ isosceles.
4. If a triangle is obtuse, then it is ___?___ isosceles.

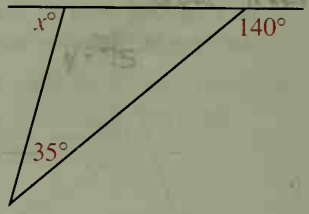
Explain how each corollary of Theorem 3-11 follows from the theorem.

5. Corollary 1
6. Corollary 2
7. Corollary 3
8. Corollary 4

Find the value of x.

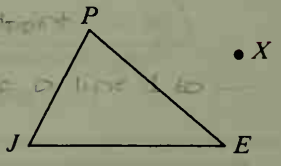
9. 

10. 

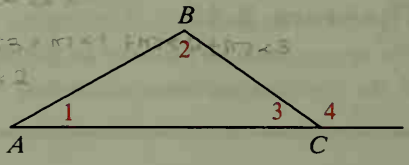
11. 

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?