Practice
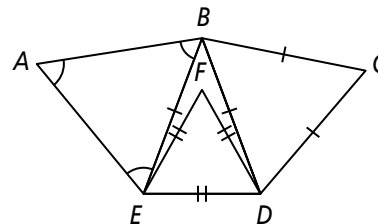
Form G

Isosceles and Equilateral Triangles

Complete each statement. Explain why it is true.

1. $\angle DBC \cong$ __?__ $\cong \angle CDB$
∠BCD; all the angles of an equilateral triangle are congruent.

2. $\angle BED \cong$ __?__
∠BDE; the base angles of an isosceles triangle are congruent.

3. $\angle FED \cong$ __?__ $\cong \angle DFE$
∠EDF; all the angles of an equilateral triangle are congruent.

4. $\overline{AB} \cong$ __?__ $\cong \overline{BE}$

$\overline{EA}$; all the sides of an equilateral triangle are congruent.

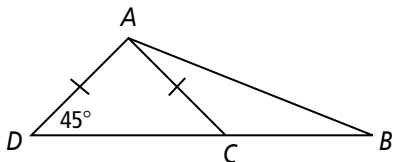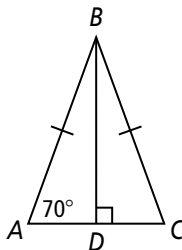**Algebra Find the values of x and y.**

5. **65; 50**

$115°$ $x°$ $y°$

6. **45; 90**

$x°$ $y°$ $135°$

7. $(y - 10)°$ **55; 70**

$(x + 5)°$

8. **30; 20**

$3y°$ $2x°$

9. $x°$ /$110°$ **70; 20**

$y°$

10. **45; 45**

$y°$ $x°$

Use the properties of isosceles and equilateral triangles to find the measure of the indicated angle.
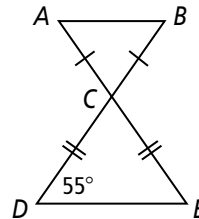
11. $m\angle ACB$ **135**

A $45°$ D C B

12. $m\angle DBC$ **20**

B $70°$ A D C

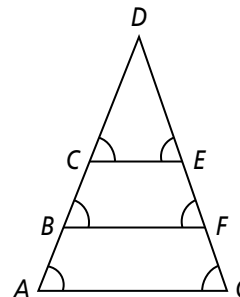**13.** $m\angle ABC$ **55**

A B C $55°$ D E

14. Equilateral $\triangle ABC$ and isosceles $\triangle DBC$ share side BC. If $m\angle BDC = 34$ and $BD = BC$, what is the measure of $\angle ABD$? (*Hint:* it may help to draw the figure described.) **172**

Practice (continued)   *Form G*

Isosceles and Equilateral Triangles

Use the diagram for Exercises 15–17 to complete each congruence statement. Explain why it is true.

15. $\overline{DF} \cong$ __?__ **DB; Converse of the Isosceles Triangle Theorem**

**16.** $\overline{DG} \cong$ __?__ **DA; Converse of the Isosceles Triangle Theorem**

17. $\overline{DC} \cong$ __?__ **DE; Converse of the Isosceles Triangle Theorem**

18. The wall at the front entrance to the Rock and Roll Hall of Fame and Museum in Cleveland, Ohio, is an isosceles triangle. The triangle has a vertex angle of 102. What is the measure of the base angles? **39**

19. Reasoning An exterior angle of an isosceles triangle has the measure 130. Find two possible sets of measures for the angles of the triangle.
50, 50, and 80; 50, 65, and 65

20. Open-Ended Draw a design that uses three equilateral triangles and two isosceles triangles. Label the vertices. List all the congruent sides and angles.
Check students' work.

Algebra **Find the values of *m* and *n*.**

21.   **45; 15**

22.   **44; 68**

23.   **67.5; 56.25**
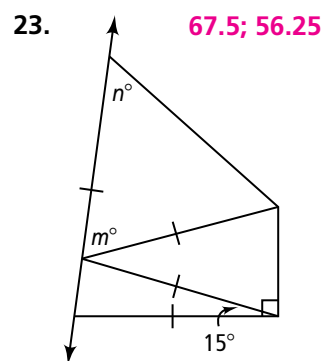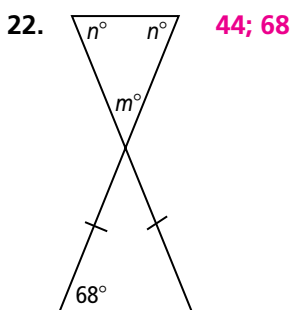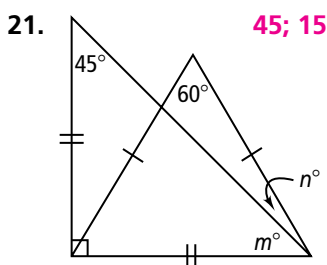
24. Writing Explain how a corollary is related to a theorem. Use examples from this lesson in making your comparison.
A theorem is a statement that is proven true by a series of steps. A corollary is a statement that can be taken directly from the conclusion of a theorem, usually by applying the theorem to a specific situation. For example, Theorems 4-3 and 4-4 are general statements about all isosceles triangles. Their corollaries apply the theorems to equilateral triangles.