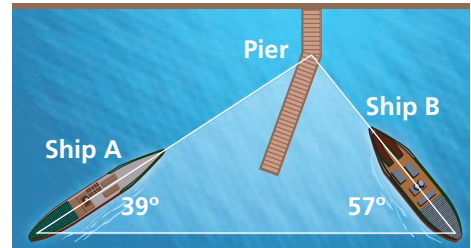## PRACTICE AND PROBLEM SOLVING

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Online Extra Practice

15. Navigation A sailor on ship A measures the angle between ship B and the pier and finds that it is 39°. A sailor on ship B measures the angle between ship A and the pier and finds that it is 57°. What is the measure of the angle between ships A and B?
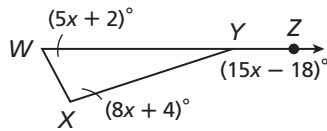

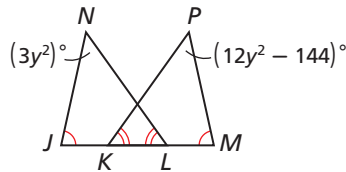**The measure of one of the acute angles in a right triangle is given. What is the measure of the other acute angle?**

16. $76\frac{1}{4}°$

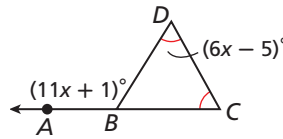**17.** $2x°$

18. $56.8°$

Find each angle measure.

19. m∠XYZ
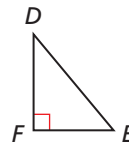

20. m∠C

21. m∠N and m∠P

22. m∠Q and m∠S
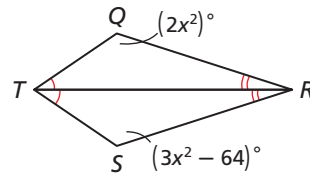
H.O.T. 23. Multi-Step The measures of the angles of a triangle are in the ratio 1:4:7. What are the measures of the angles? (*Hint:* Let x, $4x$, and $7x$ represent the angle measures.)

24. Complete the proof of Corollary 4-2-2.

Given: △DEF with right ∠F
Prove: ∠D and ∠E are complementary.
Proof:

Statements	Reasons
1. △DEF with rt. ∠F	**1. a.** ?
2. b. ?	**2.** Def. of rt. ∠
3. m∠D + m∠E + m∠F = 180°	**3. c.** ?
4. m∠D + m∠E + 90° = 180°	**4. d.** ?
5. e. ?	**5.** Subtr. Prop.
6. ∠D and ∠E are comp.	**6. f.** ?

H.O.T. 25. Prove Corollary 4-2-3 using two different methods of proof.

Given: △ABC is equiangular.
Prove: m∠A = m∠B = m∠C = 60°

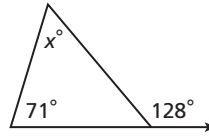**H.O.T. 26. Multi-Step** The measure of one acute angle in a right triangle is $1\frac{1}{4}$ times the measure of the other acute angle. What is the measure of the larger acute angle?

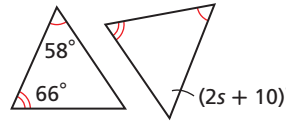**27.** Write a two-column proof of the Third Angles Theorem.

41. What is the value of *x*?

   (A) 19   (C) 57

   (B) 52   (D) 71

42. Find the value of *s*.

   (F) 23   (H) 34

   (G) 28   (J) 56

43. $\angle A$ and $\angle B$ are the remote interior angles of $\angle BCD$ in $\triangle ABC$. Which of these equations must be true?

   (A) $m\angle A - 180° = m\angle B$ (C) $m\angle BCD = m\angle BCA - m\angle A$

   (B) $m\angle A = 90° - m\angle B$ (D) $m\angle B = m\angle BCD - m\angle A$

H.O.T. 44. Extended Response The measures of the angles in a triangle are in the ratio 2:3:4. Describe how to use algebra to find the measures of these angles. Then find the measure of each angle and classify the triangle.

CHALLENGE AND EXTEND

45. An exterior angle of a triangle measures 117°. Its remote interior angles measure $(2y^2 + 7)°$ and $(61 - y^2)°$. Find the value of *y*.

H.O.T. 46. Two parallel lines are intersected by a transversal. What type of triangle is formed by the intersection of the angle bisectors of two same-side interior angles? Explain. (*Hint:* Use geometry software or construct a diagram of the angle bisectors of two same-side interior angles.)

47. Critical Thinking Explain why an exterior angle of a triangle cannot be congruent to a remote interior angle.

48. Probability The measure of each angle in a triangle is a multiple of 30°. What is the probability that the triangle has at least two congruent angles?

49. In $\triangle ABC$, $m\angle B$ is 5° less than $1\frac{1}{2}$ times $m\angle A$. $m\angle C$ is 5° less than $2\frac{1}{2}$ times $m\angle A$. What is $m\angle A$ in degrees?

MATHEMATICAL PRACTICES

FOCUS ON MATHEMATICAL PRACTICES

H.O.T. 50. Modeling Sketch a scalene triangle with a 90° exterior angle.

H.O.T. 51. Justify A right triangle has an acute angle of 63°. A second right triangle has an acute angle of 27°. How many pairs of congruent angles do the two triangles have? Justify your answer.

H.O.T. 52. Analysis Explain why a triangle can have, at most, one obtuse angle.

H.O.T. 53. Make a Conjecture Given that the exterior angle measure of a triangle equals the sum of the two remote interior angle measures, what must be the sum of three exterior angle measures (one at each vertex)? Justify your answer.