

3-4

NAME _____ DATE _____

Angles and Triangles (Pages 162–167)

A **triangle** is a polygon with three sides and three angles.

Supplementary Angles	Two angles are supplementary if the sum of their measures is 180° .
Complementary Angles	Two angles are complementary if the sum of their measures is 90° .
Sum of the Angles of a Triangle	The sum of the measures of the angles in any triangle is 180° .

EXAMPLES

A Two angles in a triangle have measures of 45° and 15° . What is the measure of the third angle?

$$45 + 15 + x = 180, \text{ so } 60 + x = 180.$$

$$\text{Solve to get } x = 120.$$

The third angle has a measure of 120° .

B Find the measure of a complement and a supplement of an angle whose measure is 34° .

$$\text{The measure of the complement is } 90 - 34 \text{ or } 56^\circ.$$

$$\text{The measure of the supplement is } 180 - 34 \text{ or } 146^\circ.$$

Try These Together

1. Find the complement and the supplement of 29° .

2. Find the complement and the supplement of 79° .

HINT: Measures of complementary angles add to 90° , and measures of supplementary angles add to 180° .

PRACTICE

Find both the complement and the supplement of each angle measure.

3. 3°

4. 14°

5. 8°

6. 64°

7. 40°

8. 23°

9. 89°

10. 48°

11. 63°

12. 20°

The measures of two angles of a triangle are given. Find the measure of the third angle.

13. $16^\circ, 45^\circ$

14. $2^\circ, 78^\circ$

15. $162^\circ, 17^\circ$

16. $42^\circ, 50^\circ$

17. $21^\circ, 101^\circ$

18. $120^\circ, 10^\circ$

Draw a diagram to represent each situation. Then define a variable, write an equation, and solve.

19. Find the measure of an angle that is 30° less than its supplement.

20. Two angles of a triangle have measures of 53° and 32° . What is the measure of the third angle?

21. **Geometry** *Congruent* angles have the same measure. One of two congruent angles in a triangle measures 42° . Find the measures of the other two angles.



22. **Standardized Test Practice** The angles of a triangle have measures $2x^\circ$, $3x^\circ$, and $4x^\circ$. What are the angle measures?

A $20^\circ, 40^\circ, 60^\circ$

B $40^\circ, 60^\circ, 80^\circ$

C $60^\circ, 80^\circ, 120^\circ$

D $80^\circ, 120^\circ, 140^\circ$

Answers: 1. $61^\circ, 151^\circ$ 2. $11^\circ, 101^\circ$ 3. $87^\circ, 177^\circ$ 4. $76^\circ, 166^\circ$ 5. $82^\circ, 172^\circ$ 6. $26^\circ, 116^\circ$ 7. $50^\circ, 140^\circ$ 8. $67^\circ, 157^\circ$ 9. $1^\circ, 91^\circ$ 10. $42^\circ, 132^\circ$ 11. $27^\circ, 117^\circ$ 12. $70^\circ, 160^\circ$ 13. 119° 14. 100° 15. 1° 16. 88° 17. 58° 18. 50° 19. 75° 20. 95° 21. $42^\circ, 96^\circ$ 22. B