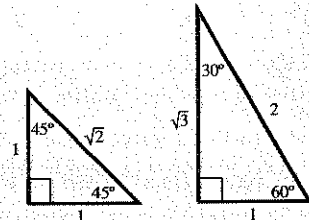


SECTION 1.1 SUMMARY

In this section you have practiced working with angles and triangles. One unit of measure of angles is degrees. An angle measuring exactly 90° is called a right angle. The sum of the interior angles of any triangle is always 180° . Triangles that contain a right angle are called right triangles. With the Pythagorean theorem you can solve for one side of a right triangle given the other two sides. The right triangles 30° - 60° - 90° and 45° - 45° - 90° are special because of the simple numerical relations of their sides.



SECTION 1.1 EXERCISES

SKILLS

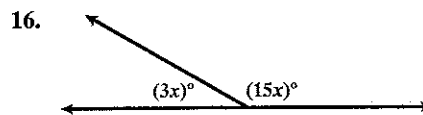
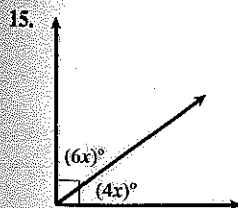
In Exercises 1–8, specify the measure of the angle in degrees using the correct algebraic sign (+ or -).

- | | | |
|--|--|---|
| 1. $\frac{1}{2}$ rotation counterclockwise | 2. $\frac{1}{4}$ rotation counterclockwise | 3. $\frac{1}{3}$ rotation clockwise |
| 4. $\frac{2}{3}$ rotation clockwise | 5. $\frac{5}{6}$ rotation counterclockwise | 6. $\frac{7}{12}$ rotation counterclockwise |
| 7. $\frac{4}{3}$ rotation clockwise | 8. $\frac{5}{9}$ rotation clockwise | |

In Exercises 9–14, find (a) the complement and (b) the supplement of each of the given angles.

- | | | | | | |
|---------------|----------------|----------------|----------------|----------------|----------------|
| 9. 18° | 10. 39° | 11. 42° | 12. 57° | 13. 89° | 14. 75° |
|---------------|----------------|----------------|----------------|----------------|----------------|

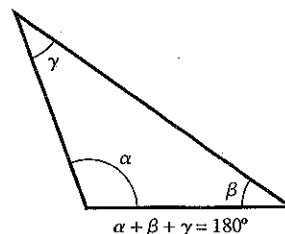
In Exercises 15–18, find the measure of each angle.



17. Supplementary angles with measures $8x$ degrees and $4x$ degrees
 18. Complementary angles with measures $3x + 15$ degrees and $10x + 10$ degrees

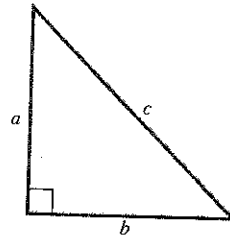
In Exercises 19–24, refer to the following triangle in the drawing.

19. If $\alpha = 117^\circ$ and $\beta = 33^\circ$, find γ .
 20. If $\alpha = 110^\circ$ and $\beta = 45^\circ$, find γ .
 21. If $\gamma = \beta$ and $\alpha = 4\beta$, find all three angles.
 22. If $\gamma = \beta$ and $\alpha = 3\beta$, find all three angles.
 23. If $\beta = 53.3^\circ$ and $\gamma = 23.6^\circ$, find α .
 24. If $\alpha = 105.6^\circ$ and $\gamma = 13.2^\circ$, find β .



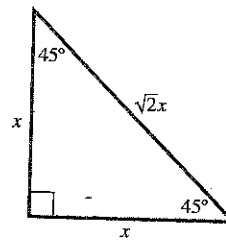
In Exercises 25–30, refer to the right triangle in the drawing. Express lengths *exactly*.

- 25. If $a = 4$ and $b = 3$, find c .
- 26. If $a = 3$ and $b = 3$, find c .
- 27. If $a = 6$ and $c = 10$, find b .
- 28. If $b = 7$ and $c = 12$, find a .
- 29. If $a = 8$ and $b = 5$, find c .
- 30. If $a = 6$ and $b = 5$, find c .



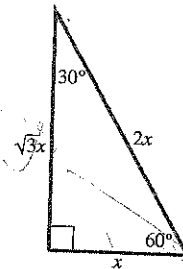
In Exercises 31–36, refer to the 45° - 45° - 90° triangle in the drawing. Express lengths *exactly*.

- 31. If each leg has length 10 inches, how long is the hypotenuse?
- 32. If each leg has length 8 meters, how long is the hypotenuse?
- 33. If the hypotenuse has length $2\sqrt{2}$ centimeters, how long is each leg?
- 34. If the hypotenuse has length $\sqrt{10}$ feet, how long is each leg?
- 35. If each leg has length $4\sqrt{2}$ inches, how long is the hypotenuse?
- 36. If the hypotenuse has length 6 meters, how long is each leg?



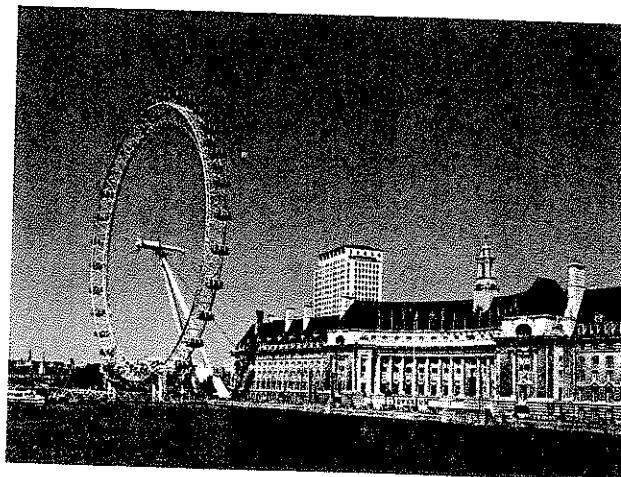
In Exercises 37–42, refer to the 30° - 60° - 90° triangle in the drawing. Express lengths *exactly*.

- 37. If the shortest leg has length 5 meters, what are the lengths of the other leg and the hypotenuse?
- 38. If the shortest leg has length 9 feet, what are the lengths of the other leg and the hypotenuse?
- 39. If the longer leg has length 12 yards, what are the lengths of the other leg and the hypotenuse?
- 40. If the longer leg has length n units, what are the lengths of the other leg and the hypotenuse?
- 41. If the hypotenuse has length 10 inches, what are the lengths of the two legs?
- 42. If the hypotenuse has length 8 centimeters, what are the lengths of the two legs?



APPLICATIONS

- 43. **Clock.** What is the measure of the angle (in degrees) that the minute hand traces in 20 minutes?
- 44. **Clock.** What is the measure of the angle (in degrees) that the minute hand traces in 25 minutes?
- 45. **One London Eye.** The London Eye (similar to a bicycle wheel) makes one rotation in approximately 30 minutes. What is the measure of the angle (in degrees) that a cart (spoke) will rotate in 12 minutes?
- 46. **London Eye.** The London Eye (similar to a bicycle wheel) makes one rotation in approximately 30 minutes. What is the measure of the angle (in degrees) that a cart (spoke) will rotate in 5 minutes?
- 47. **Revolving Restaurant.** If a revolving restaurant can rotate 270° in 45 minutes, how long does it take for the restaurant to make a complete revolution?



Index Stock

48. Revolve
rotate 72° in
restaurant to
49. Field
judged by t
fallen bird.
along the st
dog will tra
of a right tr
Pythagorean
and swim)
nearest foot

50. Field
and swim i
walks 25 fe
bird. Round

51. Christ
lights along
house is 10
many linea
Round to t