

Except for #16, all answers must be exact. Do NOT use decimal approximations for π , $\sqrt{2}$, $\sqrt{3}$, etc. Radicals must be expressed in simplest radical form, and fractions must be expressed in lowest terms. Label answers with unit measurements, where appropriate.

1. _____ Find the measure of a complementary angle to a 64° angle.
2. _____ Find the length of the hypotenuse of a right triangle with legs of lengths 4 cm and 6 cm.
3. _____ What is the degree measure of each vertex angle of a regular dodecagon?
4. _____ A gardener has a rectangular garden that is 40 m by 35 m. What are the dimensions of a similar garden with three times the area?
5. _____ Find the sum of the measures of the vertex angles of a convex octagon.
6. _____ What is the surface area of a right square pyramid if the edge of the square base is 10 m and the (perpendicular) height of the pyramid is 6 m.
7. _____ An isosceles trapezoid has one base of length 20 ft, an altitude of 8 ft, and an area of 148 sq. ft. Find the length of the other base of the isosceles trapezoid.
8. _____ The ratio of two supplementary angles is 7 to 8. What is the degree measure of each angle?
9. _____ An equilateral triangle is inscribed in a circle of radius 12 cm. Calculate the area of the circle that is not within the equilateral triangle.
10. _____ A circle has a diameter of 10 in. What is the length of a side of a square that has the same area as this circle?
11. _____ The vertex of an angle is located on a circle, and the sides of the angle subtend an arc of length 70° on the circle. What is the degree measure of the angle?
12. _____ What is the smallest angle of rotational symmetry for a regular pentagon?
13. _____ The point with coordinates $(-5, 3)$ is reflected with respect to the y-axis, translated vertically up 2 units, and then translated horizontally to the left 9 units. What are the coordinates of the image of the point after applying these transformations?
14. _____ What is the degree measure of the angle at which the diagonals of a kite intersect?
15. _____ The surface area of a sphere is 144π sq. m. Find the volume of the sphere.
16. _____ At a certain time of day, a person 1.8 m tall standing near the Washington Monument casts a 0.7 m shadow on the ground. At the same time of day, the Washington Monument casts a 65.8 m shadow on the ground. How tall is the Washington Monument? Express your answer to the nearest tenth of a meter.
17. _____ A square has a diagonal of length 7 m. Find the length of a side of the square.
18. _____ The segments \overline{AB} and \overline{CD} are chords of a circle, and they intersect at point P in the interior of the circle. Find the measure of \overline{AP} if the measures of \overline{BP} , \overline{CP} , and \overline{DP} are 8 cm, 6 cm, and 11 cm, respectively.
19. _____ A triangle has sides with lengths of 5, 7, and 9. What is the length of the midsegment that is parallel to the side of length 9?
20. _____ In Euclidean geometry, two parallel lines are intersected by a transversal. If an interior angle measures 37° , what is the degree measure of the same-side interior angle to this angle?