*For problems 1–8, answer true or false.*

1. If a polygon can be inscribed in a circle, then it must be a regular polygon.

2. The apothem of a square is always half the measure of each side.

3. A kite with diagonals that measure 1 foot and 2 feet, must have the same area as a rhombus with diagonals that measure 18 inches and 16 inches.

4. If the radius of a circle is equal in measure to the apothem of a regular pentagon, the circle must have greater area.

5. The area of a triangle with sides that measure 6, 8, and 10, can be calculated by $A = \frac{1}{2}(6)(8)$.

6. If a prism and a pyramid have congruent bases and altitudes of the same length, the volume of the pyramid is 1/3 the volume of the prism.

7. A polyhedron with six faces and ten edges must have 6 vertices.

8. If two plane figures have equal areas, then they are congruent

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9. In $\triangle ABC$, medians $\overline{AT}$, $\overline{BS}$, and $\overline{CR}$ intersect at centroid M. If AM = 8, MS = 5, and CR = 10, find MT, BS, and CM.
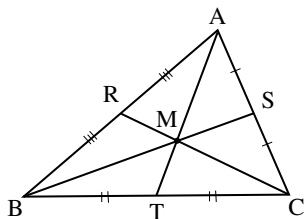

10. A regular hexagon has an apothem that measures $6\sqrt{3}$ inches. Find the area.

11. A parallelogram has side that measure 5 cm and 8 cm, and the short diagonal measures 11 cm. Find the area of the parallelogram.
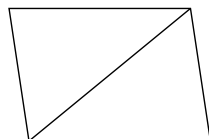

12. The area of a square is 200 cm². Find the length of the radius.

13. Home Depot sells carpet by the square yard. If a room is 1440 square feet, how many square yards of carpet will it take to cover the floor (not including waste)?

14. *Given:* $\triangle ABC$ with $\overline{BC} \parallel \overline{MN}$
$$\frac{AM}{AB} = \frac{2}{3}$$

*Find:* The ratio of the area of $\triangle AMN$ to the area of $\triangle ABC$
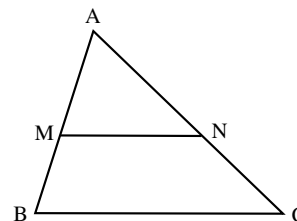
15. Find area of a trapezoid with bases measuring 9 inches and 11 inches, and the altitude measuring 1 foot.

**16.** Find the area of the shaded region in the figure.
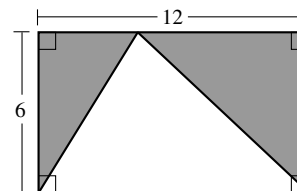
17. In a pulley system, the centers of the pulleys are 20 inches apart. If the radius of each pulley measures 6 inches, how long is the belt used in the pulley system?
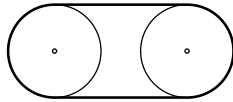
**18.** Find the area and perimeter of the sector shaded in the figure to the right.

5 ft.

150°

5 ft.
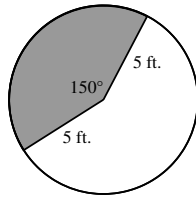
19. Find the area and perimeter of the segment shaded in the figure to the right.

10 in.

60°

10 in.
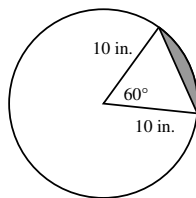
20. A piece is cut from a cylindrical block of cheese with the knife cutting along two radii. The radius is 3 inches and the height is 4 inches. If the piece represents 1/12th of the original block of cheese, find the volume and surface area of this piece.
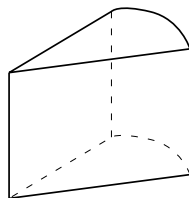
21. A pyramid with altitude 10 meters has a base in the shape of a regular pentagon with apothem measuring 4 meters and each side measuring 6 meters. Find the volume and area of the pyramid.
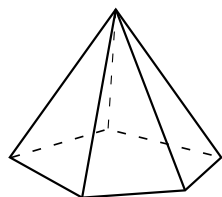
22. The inside of a vase is in the shape of a cone with radius 3 inches and altitude 14 inches. If there are 0.554 ounces in a cubic inch, how many ounces of water will the vase hold? Round your answer to 1 decimal place.

23. An industrial tank is to be built in the shape of a cylinder of radius 2 feet and a height of 4 feet. If the material for the bottom (one of the bases) costs 50¢ per square foot, and the material for the sides and the top costs 25¢ per square foot, what is the total cost of manufacturing the tank (rounded to the nearest cent)? How much fuel will the tank hold?

24. Find the volume of a sphere that is 3 meters tall.

3 m
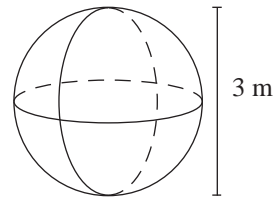
Solutions

1. false   **2.** true   **3.** true   **4.** false   **5.** true   **6.** true   **7.** true   **8.** false   **9.** MT $= 4$, BS $= 15$, CM $= \frac{20}{3}$ **10.** $216\sqrt{3}$ in^2 **11.** $8\sqrt{21}$ cm^2 **12.** 10 cm   **13.** 160 yd^2 **14.** $\frac{4}{9}$ **15.** 120 in^2

16. 36 sq. units   **17.** $(40 + 12\pi)$ in.   **18.** $A = \frac{125}{12}\pi$ ft^2; $P = (10 + \frac{25}{6}\pi)$ ft   **19.** $A = (\frac{50}{3}\pi - 25\sqrt{3})$ in^2; $P = (10 + \frac{10}{3}\pi)$ in   **20.** $V = 3\pi$ in^3; $A = (\frac{7}{2}\pi + 24)$ in^2 **21.** $V = 200$ m^3; $A = (60 + 30\sqrt{29})$ m^2

22. 73.1 oz   **23.** cost: \$21.99; volume: 16π ft^3 **24.** $\frac{9}{2}\pi$ m^3