VOLUME

### *Multiple Choice: Capital letter for the best answer.*

1. Find the volume of a regular triangular pyramid with base sides 6m and a slant height of 3m.

    A. $\frac{9\sqrt{3}}{2}$ m^3 B. 9 m^3 C. $3\sqrt{6}$ m^3 D. $3\sqrt{3}$ m^3

2. A sphere with a radius of 6 cm is inscribed in a cube. Find the volume of the cube.

    A. 216 cm^3 B. 864 cm^3 C. 1728 cm^3 D. 904 cm^3

3. The length of the base of a rectangular prism is twice the width. The perimeter of the base is 24cm. Find the height of the prism if the volume is 160 cm^3.

    A. $6\frac{2}{3}$ cm   B. 5 cm   C. 8 cm   D. 10 cm

Free Response: Show all work for full credit. HINT: Draw and label figures. Write out your "plan" for the process of getting an answer.

4. Alex made a scale model of a submarine for his science class. If 1 inch in the model represents 20 feet in the actual submarine, what is the volume of the actual sub?
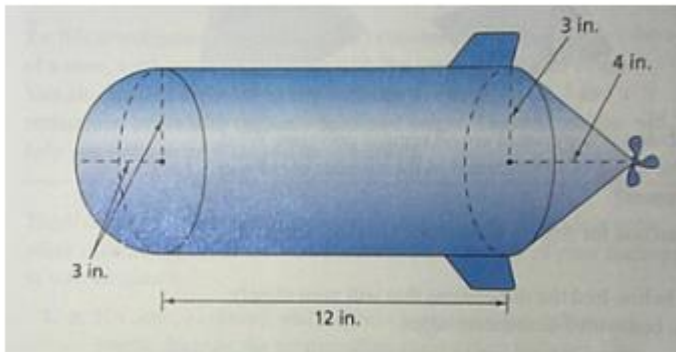
5. A trapezoidal prism has a height of 15m. The trapezoids have bases 6m and 12m and a height of 4m. Find the volume.

6. A right cylindrical glass 8 cm in diameter contains water to a depth of 4 cm. What volume of water must be added to raise the height to 10 cm?

7. A rocket is made of a cone on top of a cylinder. The cylinder has a diameter of 16ft and a height of 50 ft. The cone on top has a slant height of 17 ft. If 60% of the space in the rocket is needed for fuel, what is the volume, to the nearest foot, of the portion of the rocket that is available for non fuel items?

8. The volume of a cone is 800π u^3. Find the height of the cone **in terms of** the radius.

9. Find the volume of a pyramid whose height is 23 cm and whose base is a rhombus with diagonals 16 cm and 20cm.

10. Find the volume of a regular triangular pyramid with a base of 6cm and a height of 7 cm.

11. A right cylinder has a radius 3 and height 8. A cone has the same radius as the cylinder. Find the height of the cone if the two have the same volume.

12. Find the volume between a cube and a cylinder **inside** if the cube has side length of 12 and the cylinder has a radius of 3.

13. The slant height of a cone measures 18 mm and the altitude measures 9mm. Find the volume of the cone.

14. The corresponding edges of two similar triangular prisms are in a ratio of 3:5. If the volume of the larger prism is 1250 in³, what is the volume of the smaller prism?
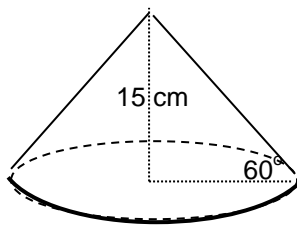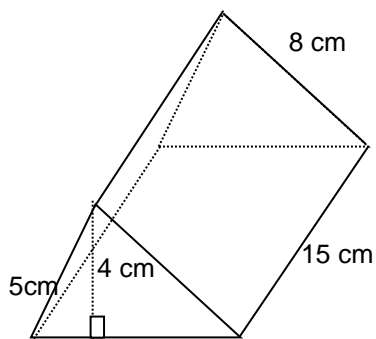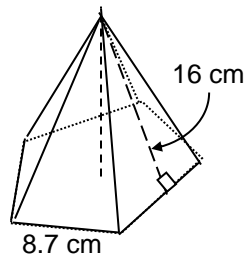
TOTAL SURFACE AREA

1.

9 m
11 m
11 m
9 m

1.TSA = _____

2.

15 cm
60°

2. LA = _____
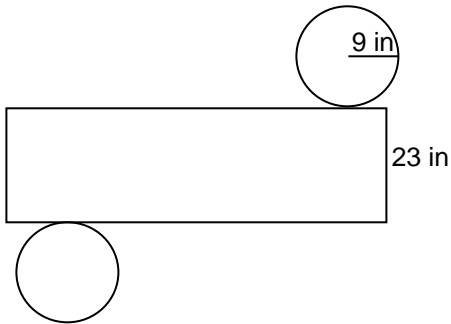
3.

8 cm
15 cm
4 cm
5cm
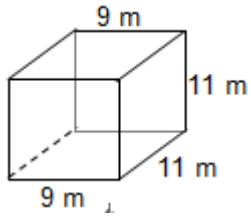
3. TSA = _____

4. Find the total surface area of
   this regular pentagonal pyramid.

4. _____

16 cm

8.7 cm

5. Find the total surface area for this net?

5. _____

9 in

23 in

6. An elephant is standing on a circular platform that is larger on the bottom

than it is on top (a cone that has been cut off). If the diameter of the top circle

is 4 feet, the diameter of the bottom circle is 6 feet and the platform angles in

at a 45 degree angle, What is the surface area of the platform?

6. _____

7. Find the total surface area of a cube with a cylinder cut out. The sides

   of the cube are 20 m and the diameter of the cylinder is 16 m.

7. _____

8. Find the lateral area of a triangular pyramid with a height

   of 8 in and a base that is an equilateral triangle with

   sides that measure $12\sqrt{3}$ in.

8. _____

9. A regular square pyramid has a slant height of 21 units   9. _____
   and a lateral edge of 29 units. Find its total surface area.

10. Find the surface area of a right cone whose slant height is   10. _____
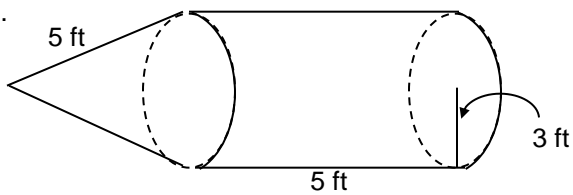   15 mm. The radius of the base is 9 mm.

11. Find the total surface area of a cone whose height   11. _____
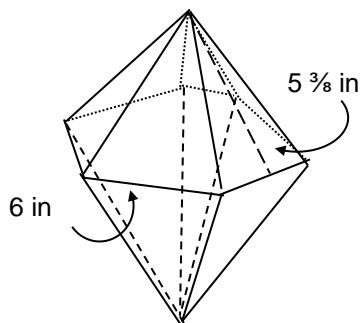   is 24 ft. The radius of the base is 7 ft.

Find the surface area of each figure (Bases are regular polygons).

12.

5 ft

5 ft

3 ft

12.T = _____

13.

6 in

5 ⅜ in
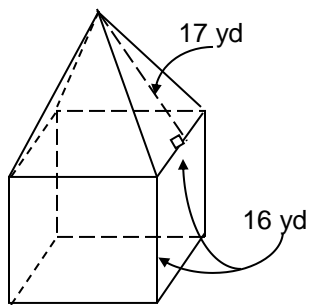
The pyramids are
congruent regular
hexagonal right
pyramids.

13. T= _____

14.

14. T=_____

15. Find the total surface area a regular triangular pyramid with base edge 4 cm and slant height 6 cm.

16. Find the total surface area a regular pentagonal pyramid with base edge 1.5 m and slant height 9 m.
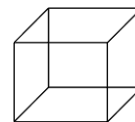
17. Find the surface area of a regular triangular prism if the base edge is 6 cm and height is 4 cm.

18. What is the surface area of the right cone, whose net is shown?
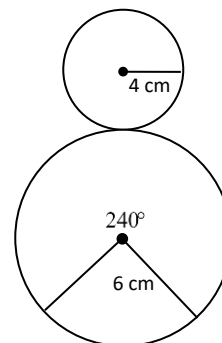
19. A regular right pyramid has a height of 12 feet. The area of its square base is 100 square feet. Find its surface area.

20. Find the total area of a cube with edges of length $5\sqrt{3}$ inches.

21. Find the lateral area and total area of a right prism whose height is 12 and whose base is a regular hexagon with sides of length 18.

22. Find the lateral area and total area of a right prism whose height is 7, and whose base is an isosceles triangle with sides 13, 13 and 10.
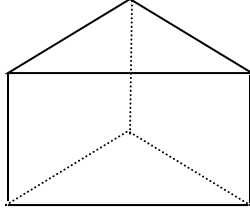
23. Given that the base of a right prism is a rhombus with diagonal 6 cm and 8 cm, and that the height of the prism is 14, find the lateral area of the prism.

24. Find the lateral area and total area of the solid shown
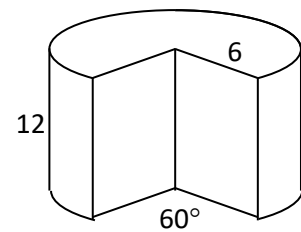
24. Find the lateral area and total area to the *nearest tenth* of a regular hexagonal pyramid if the slant height is 12 inches and the base has sides of length 6 inches.

25. Find the total surface area of a hexagonal pyramid if the sides of the base each have length 6 cm and the height is 18 cm.

26. If the total surface area of a right cylinder is 266π and its height is 12, then what is its lateral area?

27. The height of a prism with square bases is three times the length of a base edge. If the surface area is 350, find a length of the base of the prism.

28. Find the lateral area and total area of a cylinder with base diameter 18u and height 11u.