

For #1-6, suppose a sphere has the given information. Complete the chart and leave your answers in terms of π .

	1.	2.	3.	4.	5.	6.
Radius	7	5	4	9	6	3
Total Area	196π	100π	64π	324π	144π	36π
Volume	$\frac{1372\pi}{3}$	$\frac{500\pi}{3}$	$\frac{256\pi}{3}$	972π	288π	36π

Solve each word problem. Please leave your answers in the specified form.

7) A full scoop of ice cream with diameter 6cm is placed in an ice-cream cone with diameter 5cm and height 12cm. Is the cone big enough to hold all the ice cream if it melts?

$$V = \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} \pi (3)^3$$

$$V = 36\pi$$

$$V = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \pi (2.5)^2 \cdot 12$$

$$V = 25\pi$$

No, the cone will not be big enough to hold the melted ice cream.

8) Approximately 70% of the Earth's surface is covered by water. If the radius of the Earth is approximately 6380km, find the area covered by water to the nearest million square kilometers.

$$TA = 4\pi r^2$$

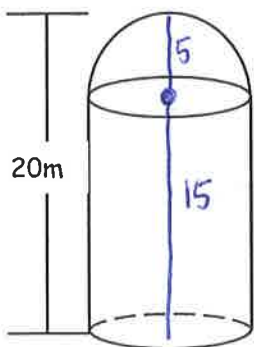
$$= 4\pi (6380)^2$$

$$= 511,247,264$$

$$511,247,264 (.70)$$

$$= 357,873,085 \text{ km}^2$$

9) A silo of a barn consists of a hemisphere (half a sphere) on top of a cylinder. Find the volume of a silo with a diameter of 10m and height of 20m. Round to the nearest tenth. Use $\pi = 3.14$.



$$V_{\text{sphere}} = \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} \pi (5)^3$$

$$= 523.3$$

$$V = \frac{523.3}{2}$$

$$= 261.7$$

$$V_{\text{cyl}} = \pi r^2 h$$

$$= \pi (5)^2 \cdot 15$$

$$= 1177.5$$

Volume of Silo =
 $1,439.2 \text{ m}^3$

10) A hollow rubber ball has an outer radius of 11cm and inner radius of 10cm. Find the volume of the rubber to the nearest cubic centimeter. Use $\pi = 3.14$.

$$V = \frac{4}{3} \pi (r)^3$$

$$= \frac{4}{3} \pi (11)^3$$

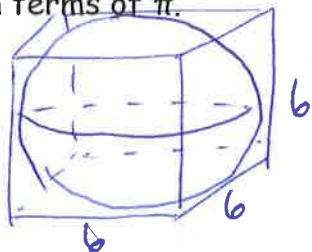
$$V = 5572 \text{ cm}^3$$

$$V = \frac{4}{3} \pi (10)^3$$

$$= 4187 \text{ cm}^3$$

Volume of
Rubber =
1,385 cm³

11a) Find the volume of a sphere inscribed in a cube with edges 6cm long. Leave your answer in terms of π .



Diameter = 6cm
Radius = 3cm

$$V = \frac{4}{3} \pi (3)^3$$

$$V = 36 \pi \text{ cm}^3$$

b) Find the volume of the region inside the cube but outside the sphere. Leave your answer in terms of π .

$$V_{\text{cube}} = Bh$$

$$= (b \cdot b) \cdot b$$

$$= 21b$$

$$V = 21b - 36\pi \text{ cm}^3$$

12) A standard sized basketball has a circumference of 29.5 inches. Use $\pi = 3.14$.

a) Determine the number of square inches of rubber necessary to construct the ball. Round to the nearest tenth.

$$C = 2\pi r$$

$$29.5 = 2(3.14) \cdot r$$

$$r = 4.7$$

$$TA = 4\pi r^2$$

$$= 4\pi (4.7)^2$$

$$TA = 277.5 \text{ in}^2$$

b) How many cubic inches of air are required to inflate the ball? Round to the nearest tenth.

$$V = \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} \pi (4.7)^3$$

$$V = 434.7 \text{ in}^3$$

13) Which figure will have the largest volume? Leave your answers in terms of π and show all work.

Figure A: Cylinder with radius = 3in and height = 6in.

Figure B: Cone with radius = 6in and height = 4in.

Figure C: Sphere with radius = 3in.

The Cylinder!

A) $V = \pi r^2 h$
 $= \pi (3)^2 \cdot 6$
 $= 54 \pi \text{ in}^3$

B) $V = \frac{1}{3} \pi r^2 h$
 $= \frac{1}{3} \pi \cdot 6^2 \cdot 4$
 $V = 48 \pi \text{ in}^3$

C) $V = \frac{4}{3} \pi r^3$
 $= \frac{4}{3} \pi (3)^3$
 $V = 36 \pi \text{ in}^3$