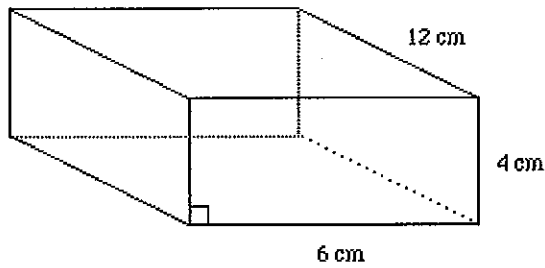


Volume

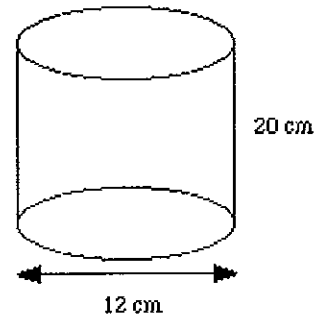
Use $\pi = 3.14$ and give answers, where appropriate, to 3 significant figures.

1. Find the volumes of the following:

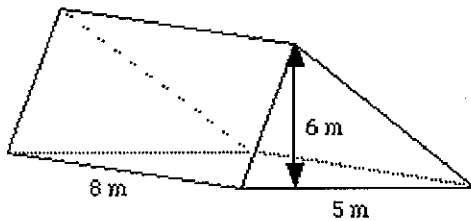
a.



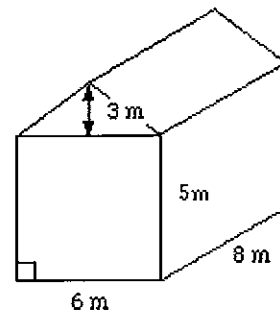
c.



b.



d.



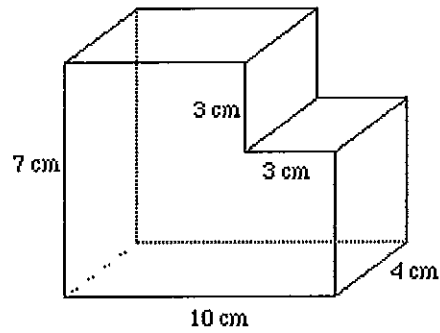
2. A cuboid measures 3 m by 4 m by 0.5 m.

(a) Find its volume in m^3 .

(b) Change its lengths to centimetres and find its volume in cm^3 .

(c) What is its surface area in m^2 ?

3. Find the volume of the solid shown below.



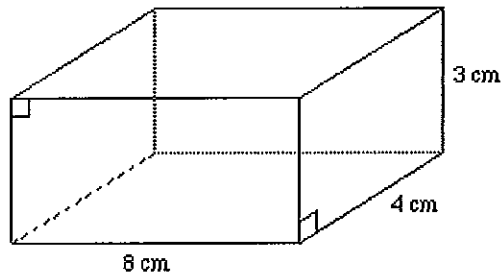
4. An open-topped, rectangular water tank is 3 m long, 2 m wide and 4 m high.

(a) What is the volume of the tank?

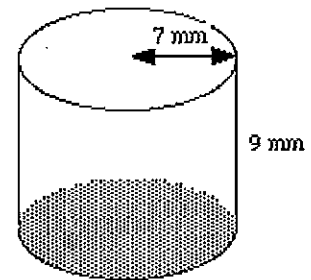
(b) What is the surface area of the outside of the tank?

5. Find the surface area of the following:

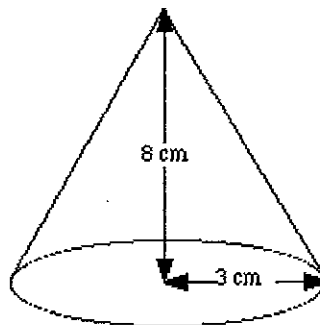
a.



b. Use $\pi = 3.14$



6. Find the volume of the cone:



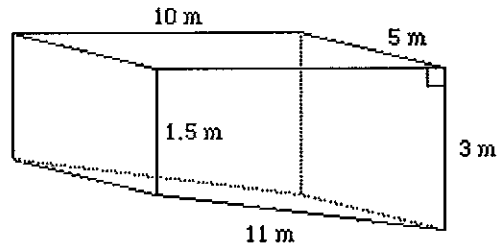
7. Find the volume and surface area of a sphere of diameter 8 cm.

8. Find the radius of a solid cone of vertical height 15 cm and a slant height of 17 cm.

Find the volume of this cone and its surface area.

9. Find the radius of a cylinder of volume 5.5 m^3 and height 7 m.

10. A swimming pool is shown in the diagram (the measurements are the inside of the pool).



- (a) Find the volume of the pool in cubic metres.
- (b) Find the surface area of the inside of the pool.
- (c) It costs \$40 to paint 50 m^2

How much will it cost to paint inside the pool with 3 coats of paint?



Area

1. (a) Volume = base x height x length
 $= 12 \times 4 \times 6 = 288 \text{ cm}^3$

(b) Volume = Area of triangle x length
 $= (0.5 \times 5 \times 6) \times 8 = 120 \text{ m}^3$

(c) Volume = Area of circle x height
 $= (\pi \times 6^2) \times 20 = 2260 \text{ cm}^3$

(d) Volume = Area of cuboid + Area of triangular prism
 $= 5 \times 6 \times 8 + 0.5 \times 6 \times 3 \times 8 = 312 \text{ m}^3$

2.(a) Volume = $3 \times 4 \times 0.5 = 6 \text{ m}^3$

(b) $3 \text{ m} = 300 \text{ cm}$, $4 \text{ m} = 400 \text{ cm}$, $0.5 \text{ m} = 50 \text{ cm}$
 Volume = $300 \times 400 \times 50 = 6\,000\,000 \text{ cm}^3$

(c) Surface area = $2 \times (3 \times 4 + 3 \times 0.5 + 4 \times 0.5) = 31 \text{ m}^2$

3. Volume of solid = Area x length
 $= (7 \times 10 - 3 \times 3) \times 4 = 244 \text{ cm}^3$

4. (a) Volume of tank = $3 \times 2 \times 4 = 24 \text{ m}^3$

(b) Surface area = $3 \times 2 + 2 \times (2 \times 4 + 3 \times 4) = 46 \text{ m}^2$

5. (a) Surface area = $2 \times (8 \times 4 + 4 \times 3 + 3 \times 8)$
 $= 136 \text{ cm}^2$

(b) Surface area = Area of circle x height
 $= 2\pi r^2 + 2\pi r l$
 $= 2\pi 7^2 + 2\pi 7.9 = 703 \text{ mm}^2$ (to 3 s.f.)

6. Volume of cone = $1/3 \times$ area of base x height
 $= 1/3 \times \pi 3^2 \times 8 = 75.4 \text{ cm}^3$ (to 3 s.f.)

7. Volume of sphere = $4/3\pi r^3$
 $= 4/3 \cdot 3.14 \cdot 4^3 = V = 268 \text{ cm}^3$ (to 3 s.f.)

Surface area = $4\pi r^2$
 $= 4 \cdot 3.14 \cdot 4^2 = 201 \text{ cm}^2$ (to 3 s. f.)

8. Using Pythagoras' Theorem $r^2 = 17^2 - 15^2$
 $r = 8 \text{ cm}$,

Volume = $1/3\pi r^2 h =$
 $1/3 \times 3.14 \times 8^2 \times 15 = 1000 \text{ cm}^3$ (to 3 s. f.)

$$\text{Surface area} = \pi r l + \pi r^2 = 3.14 \times 8 \times 17 + 3.14 \times 8^2$$
$$= \mathbf{628 \text{ cm}^2} \text{ (to 3 s. f.)}$$

9. Volume of a cylinder = $\pi r^2 h$

$$5.5 = 3.14 \times r^2 \cdot 7$$

$$r = \mathbf{0.500 \text{ m}} \text{ (to 3 s.f.)}$$

10. (a) Volume of pool = $0.5 (1.5 + 3) \times 10 \times 5$

$$= \mathbf{112.5 \text{ m}^3}$$

(b) Surface area of inside of pool = $5 \times 3 + 1.5 \times 5 + 11 \times 5 + 2 \times 0.5 \times (1.5 + 3) \times 10$

$$= \mathbf{122.5 \text{ m}^2}$$

(c) Cost of paint = $3 \times 122.5/50 \times 40 = \mathbf{\$294}$



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