# Basic Surface Area and Volume of CONES Notes
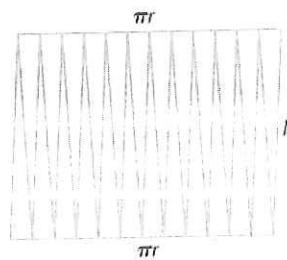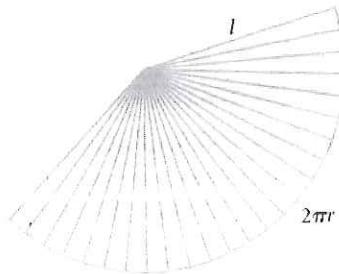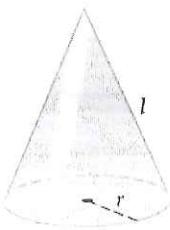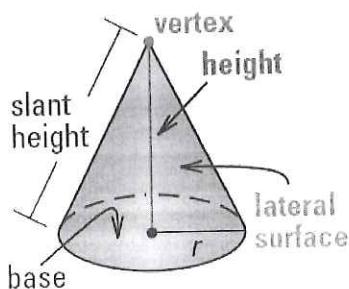
Surface Area:	Lateral Area:	Volume:
$SA = \pi r^2 + \pi r l$	$LA = \pi r l$	$V = \dfrac{1}{3} BH$ B = AREA of BASE B= πr^2 H= Height perpendicular to the base.

Find the volume and surface area of the solid. Round to the nearest tenth.

1.

13.6 cm = ℓ

4.7 cm = r
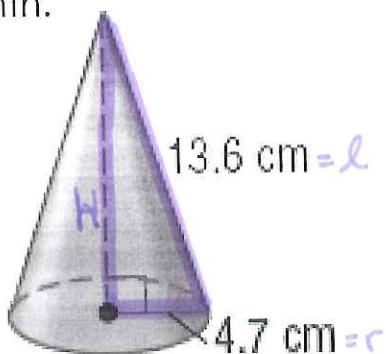
Find h

$H^2 + 4.7^2 = 13.6^2$

$H = 12.8$ cm

SA= __270.2 cm²__

V = __296.1 cm³__

$SA = \pi r^2 + \pi r l$

$= \pi \, 4.7^2 + \pi \, 4.7 \cdot 13.6$

$\boxed{SA \approx 270.2 \text{ cm}^2}$

$V = \frac{1}{3} BH$

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

$V = \frac{1}{3} \pi (4.7)^2 (12.8)$

$\boxed{V \approx 296.1 \text{ cm}^3}$

2.

$d = 15$ cm
$r = 7.5$

15 cm

7.5

7.5

ℓ
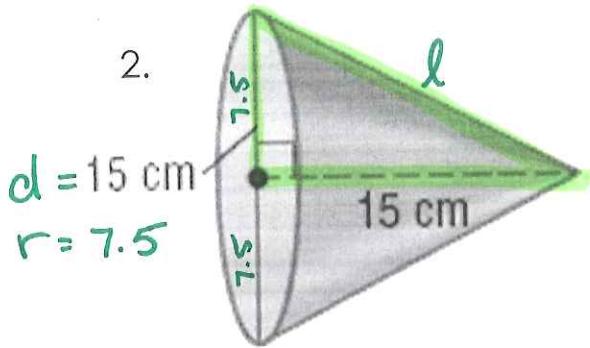
SA= __572.6 cm²__

$V =$ __883.6 cm³__

Find ℓ

$7.5^2 + 15^2 = \ell^2$

$\ell = 16.8$ cm

$SA = \pi r^2 + \pi r \ell$

$\quad = \pi\, 7.5^2 + \pi\, 7.5 \cdot 16.8$

$SA \approx 572.6$ cm²

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

$\quad = \frac{1}{3}\pi\, 7.5^2 \cdot 15$

$V \approx 883.6$ cm³

3. A cone has a radius of 6 m and a surface area of 66π m². Find the slant height of the cone.

$SA = \pi r^2 + \pi r \ell$

$66\pi = \pi\, 6^2 + \pi\, 6\, \ell$

$66\pi = 36\pi + 6\pi \ell$

$\dfrac{30\,\pi}{6\,\pi} = \dfrac{6\,\pi\,\ell}{6\,\pi}$

$\boxed{\ell = 5 \text{ m}}$

4. The cone below has a volume of 242π m³. Find the height.
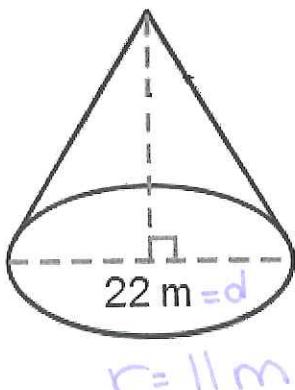
$242\pi = \frac{1}{3}\pi\, 11^2\, h$

$\dfrac{242\,\pi}{40.3\,\pi} = \dfrac{40.3\,\pi\, h}{40.3\,\pi}$

$\boxed{6 \text{ m} = h}$

22 m = d

r = 11 m

5. Find the surface area and volume of the composite solid.

Find ℓ

$$3^2 + 4^2 = \ell^2$$
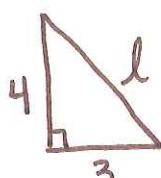
$$\boxed{\ell = 5}$$
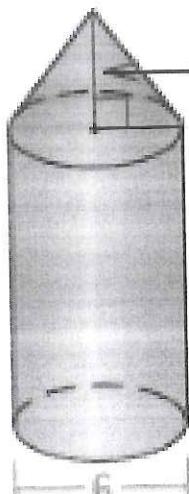
$d = 6$
$r = 3$

$V = $ cone + cylinder

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

$$V = \tfrac{1}{3}\pi 3^2 \cdot 4 + \pi 3^2 \cdot 10$$

$$\boxed{V \approx 320.4 \text{ units}^3}$$

$SA = $ cone + cylinder

$$SA = \cancel{\pi r^2} + \pi r \ell + \cancel{\pi r^2} + 2\pi r h$$

only 1 circle from cylinder showing

no circle showing from cone

$$= \pi 3 \cdot 5 + \pi 3^2 + 2\pi 3 \cdot 10$$

$$\boxed{SA \approx 263.9 \text{ units}^2}$$

6. Find the surface area of the composite solid.

8.4 cm

3 cm

5.1 cm

3 cm
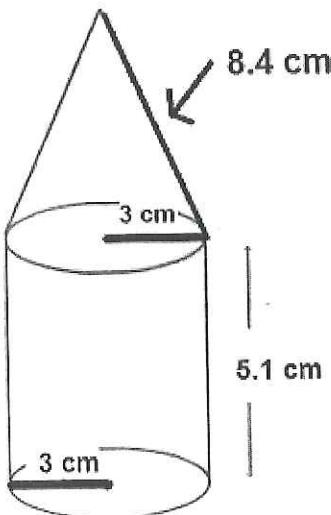
$SA = $ cone + cylinder

cylinder w/ only 1 base

$$SA = \cancel{\pi r^2} + \pi r \ell + \cancel{\pi r^2} + 2\pi r h$$

cone w/o base

$$= \pi 3 \cdot 8.4 + \pi 3^2 + 2\pi 3 \cdot 5.1$$

$$\boxed{SA \approx 203.6 \text{ cm}^2}$$

on test