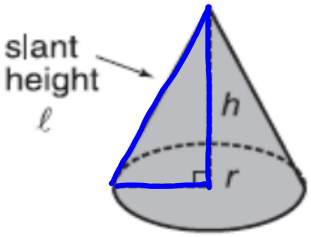
Geometry 1-2 Name_____

Class- Notes Date_____Per_____

Surface Area and Volume of Cones

$h^2 + r^2 = \ell^2$

Cone



Formulas

Shape CONE

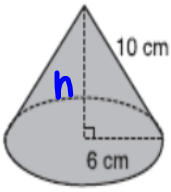
$\pi r^2 + \pi r \ell$

Surface Area (SA)= $B + \frac{1}{2}C \cdot \ell$

Volume (V) = $\frac{1}{3}B \cdot h$

$h^2 + 6^2 = 10^2 \rightarrow h^2 = 100 - 36 \rightarrow \sqrt{h^2} = \sqrt{64}$

Example 1: Find the surface area and the volume of the cone below:



$B = \pi(6)^2 = 36\pi \text{ cm}^2$

$C = 2\pi(6) = 12\pi \text{ cm}$

$h = 8 \text{ cm}$

$\ell = 10 \text{ cm}$

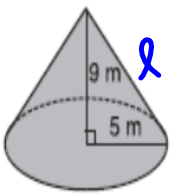
$SA = 36\pi + \frac{1}{2}(12\pi)10$

$= 36\pi + 60\pi = 96\pi \text{ cm}^2$

$V = \frac{1}{3}(36\pi)8 = 96\pi \text{ cm}^3$

$5^2 + 9^2 = \ell^2 \rightarrow 25 + 81 = 106$

Example 2: Find the surface area and the volume of the cone below:



$B = 25\pi \text{ m}^2$

$C = 10\pi \text{ m}$

$h = 9 \text{ m}$

$\ell = \sqrt{106} \approx 10.3 \text{ m}$

$SA = 25\pi + \frac{1}{2}(10\pi)(10.3)$

$= 25\pi + 51.5\pi$

$\approx 76.5\pi \text{ m}^2$

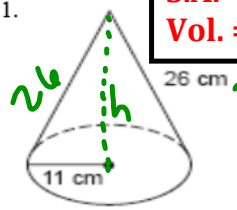
$V = \frac{1}{3}(25\pi)(9) = 75\pi \text{ m}^3$

$h^2+11^2=26^2 \rightarrow h^2=676-121=555$

$h^2+2^2=7^2 \rightarrow h^2=49-4=45$

Homework: Find the Surface Area and Volume of the **cones.**

1.



S.A. = 407π cm²
Vol. = 951.9π cm³

$B=\pi(11)^2=121\pi\,cm^2$

$C=2\pi(11)=22\pi\,cm$

$\ell=26$

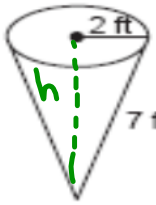
$h=\sqrt{555}\approx 23.6\,cm$

$S.A.=121\pi+\frac{1}{2}(22\pi)26$

$=121\pi+286\pi=407\pi\,cm^2$

$V=\frac{1}{3}(121\pi)(23.6)\approx 951.9\,cm^3$

2.



S.A. = 18π ft²
Vol. = 8.9π ft³

$B=\pi(2)^2=4\pi\,ft^2$

$C=2\pi(2)=4\pi\,ft$

$\ell=7\,ft$

$h=\sqrt{45}\approx 6.7\,ft$

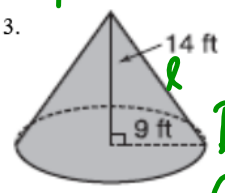
$S.A.=4\pi+\frac{1}{2}(4\pi)7$

$=4\pi+14\pi=18\pi\,ft^2$

$V=\frac{1}{3}(4\pi)(6.7)\approx 8.9\pi\,ft^3$

$\ell^2=14^2+9^2=196+81=277$

3.



S.A. = 230.9π ft²
Vol. = 378π ft³

$B=\pi(9)^2=81\pi\,ft^2$

$C=2\pi(9)=18\pi\,ft$

$h=14\,ft$

$\ell=\sqrt{277}\approx 16.6\,ft$

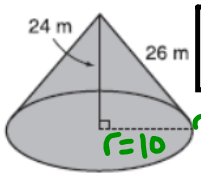
$S.A.=81\pi+\frac{1}{2}(18\pi)(16.6)$

$=81\pi+149.8\pi\approx 230.9\,ft^2$

$V=\frac{1}{3}(81\pi)(14)=378\pi\,ft^3$

$24^2+r^2=26^2 \rightarrow r^2=676-576=100$

4.



S.A. = 360π m²
Vol. = 800π m³

$B=\pi(10)^2=100\pi\,m^2$

$C=2\pi(10)=20\pi\,m$

$h=24\,m$

$\ell=26\,m$

$S.A.=100\pi+\frac{1}{2}(20\pi)(26)$

$=100\pi+260\pi=360\pi\,m^2$

$V=\frac{1}{3}(100\pi)(24)=800\pi\,m^3$