Geometry | Monday 4-15-13 | Class Notes

Ch 11-4 Spheres

circle ⇒ the locus (location) of points in a plane (flat surface) that are a fixed (constant) distance from a single point called the center.

sphere (a ball or globe) ⇒ the locus of points in <u>space</u> that are a fixed distance from a single point called the center.

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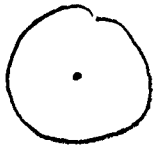
circle



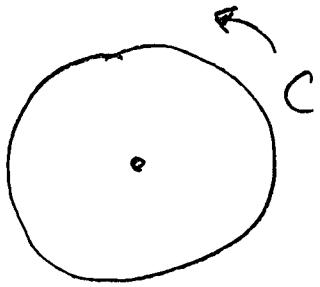
semi-circle

sphere

hemi-sphere or hemisphere

Formulas for Circles and Spheres

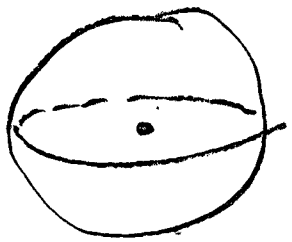
Circles



$C = 2\pi r$

$A = \pi r^2$

Spheres



COMPARE ⟷

$S.A. = 4\pi r^2$

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

S.A. means SURFACE Area

(Ex) Find S.A. and V for sphere with $r = 9$ cm (EXACT)

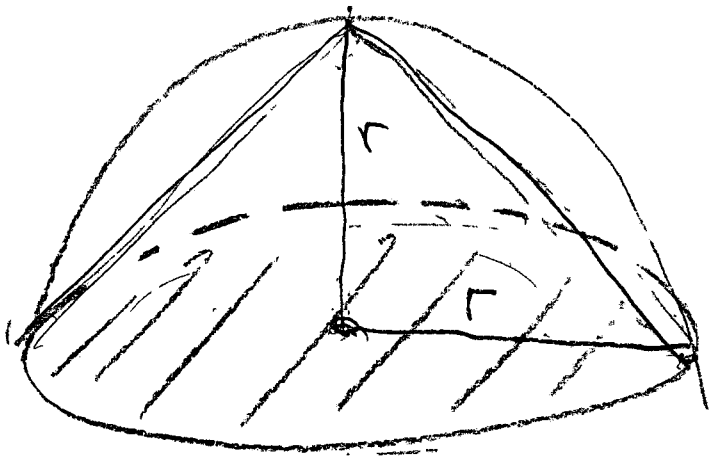
$S.A. = 4\pi r^2 = 4\pi(9)^2 = 4\pi(81)$

$S.A. = 324\pi \text{ cm}^2$ EXACT

$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(9)^3 = \frac{4}{3}\pi 729$

$= 4\pi 243$

$V = 972\pi \text{ cm}^3$ EXACT



* $S.A. = 4\pi r^2$

$V_{cone} = \frac{1}{3}\pi r^2 \cdot r = \frac{1}{3}\pi r^3$

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

(24) S.A. & V of sphere with $r = 10cm$

$S.A. = 4\pi r^2 \therefore 4\pi(10)^2 = \boxed{400\pi\, cm^2}$ S.A.

$V = \frac{4}{3}\pi r^3 \therefore \frac{4}{3}\pi(10)^3 = \boxed{\frac{4000}{3}\pi\, cm^3}$ Volume

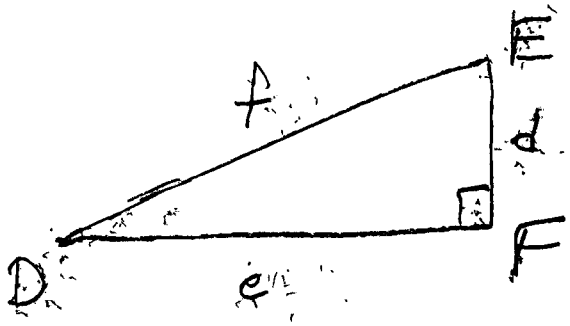
Remediation:

Finding missing sides and angles in a $\triangle$ using SOH CAH TOA

$$\sin = \frac{O}{H} \Rightarrow SOH$$

$$\cos = \frac{a}{H} \Rightarrow CAH$$

$$\tan = \frac{O}{a} = TOA$$



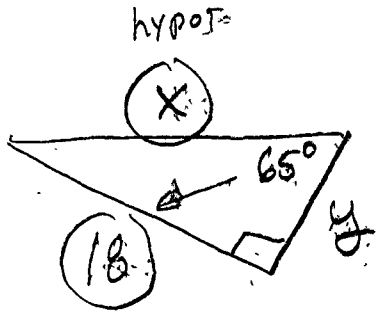
$$\sin D = \frac{d}{f} \qquad \sin E = \frac{e}{f}$$

$$\cos D = \frac{e}{f} \qquad \cos E = \frac{d}{f}$$

$$\tan D = \frac{d}{e} \qquad \tan E = \frac{e}{d}$$

Practice

(19)



Nearest $\frac{1}{10} = .x$

$$x \sin 65^\circ = \frac{18}{x} \cdot x$$

(TRIG TABLE)

$$\frac{x \sin 65^\circ}{\sin 65^\circ} = \frac{18}{\sin 65^\circ}$$

$$x = \frac{18}{\sin 65^\circ} = \frac{18}{.9063}$$

$$x = 19.8610$$

$x = 19.9$ units

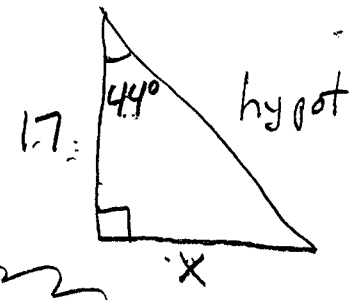
$$y \tan 65^\circ = \frac{18}{y} \cdot y$$

$$\frac{y \tan 65}{\tan 65} = \frac{18}{\tan 65}$$

$$y = \frac{18}{2.1445} = 8.394$$

$y = 8.4$ units

(21)



$17 \tan 44° = \frac{x}{17} \cdot 17$

$\downarrow \pi$

$17(.9657) = x$

$16.417 = x$

$\boxed{16.4 = x}$ units

$$\begin{array}{r} .9657 \\ \times \quad 17 \\ \hline 67599 \\ 9657 \\ \hline 16.4169 \end{array}$$

$12 \tan 45 = \frac{x}{12} \cdot 12$

$\frac{x \tan 45}{\tan 45} = \frac{12}{x} \cdot x$

$\tan 45$