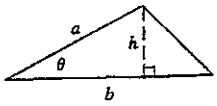
Geometry

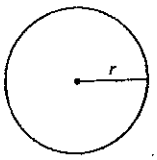
Geometric Formulas

Formulas for area A, circumference C, and volume V:

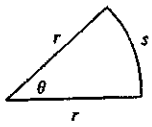
Triangle
$A = \frac{1}{2}bh$
$= \frac{1}{2}ab \sin\theta$



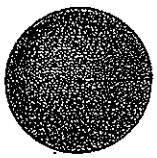
Circle
$A = \pi r^2$
$C = 2\pi r$



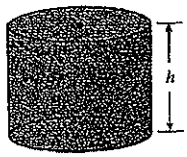
Sector of Circle
$A = \frac{1}{2}r^2\theta$
$s = r\theta$ (θ in radians)



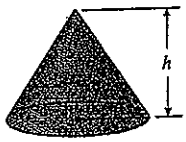
Sphere
$V = \frac{4}{3}\pi r^3$
$A = 4\pi r^2$



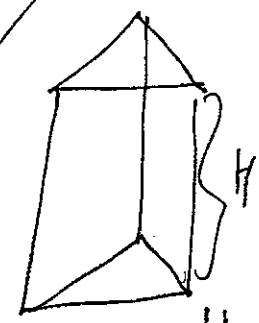
Cylinder
$V = \pi r^2 h$



Cone
$V = \frac{1}{3}\pi r^2 h$
$A = \pi r\sqrt{r^2 + h^2}$



Perimeter, Area, Volume of square, rectangle, cube, etc.



$V = BH$
$V = \frac{1}{2}bH$

Distance and Midpoint Formulas

Distance between $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Midpoint of $\overline{P_1P_2}$: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

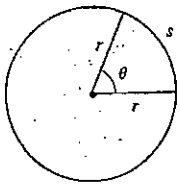
Angle Measurement

π radians $= 180°$

$1° = \frac{\pi}{180}$ rad $\qquad$ 1 rad $= \frac{180°}{\pi}$

$s = r\theta$

(θ in radians)



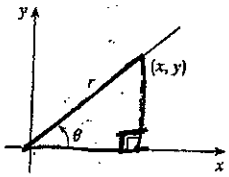
Trigonometric Functions

right △

$\sin\theta = \frac{y}{r}$ $\qquad$ $\csc\theta = \frac{r}{y}$

$\cos\theta = \frac{x}{r}$ $\qquad$ $\sec\theta = \frac{r}{x}$

$\tan\theta = \frac{y}{x}$ $\qquad$ $\cot\theta = \frac{x}{y}$



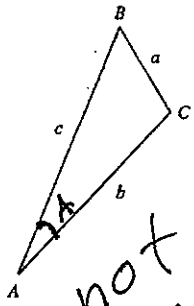
$x^2 + y^2 = r^2$

The Law of Sines

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

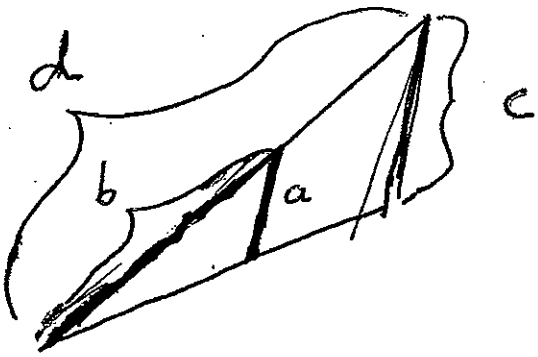
The Law of Cosines

$$a^2 = b^2 + c^2 - 2bc\cos A$$



not a right △

Similar triangles:



$$\frac{a}{b} = \frac{c}{d}$$

for right and not right △