

ACBA4021 Formula Sheet

Essential Formulas for ACBA4021 Module

1. Algebra

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

2. Trigonometry

$$a^2 + b^2 = c^2$$

$$\sin \theta = \frac{\textit{Opposite}}{\textit{Hypotenuse}}$$

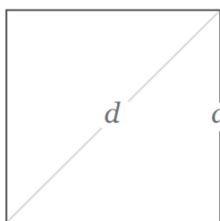
$$\cos \theta = \frac{\textit{Adjacent}}{\textit{Hypotenuse}}$$

$$\tan \theta = \frac{\textit{Opposite}}{\textit{Adjacent}}$$

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

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

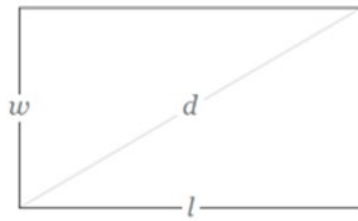
3. Mensuration



$$\textit{Perimeter} = 4a$$

$$\textit{Diagonal} = \sqrt{2}a$$

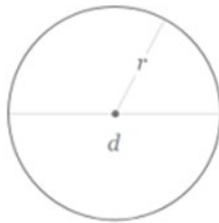
$$\textit{Area} = a^2$$



$$\text{Perimeter} = 2(l + w)$$

$$\text{Diagonal} = \sqrt{l^2 + w^2}$$

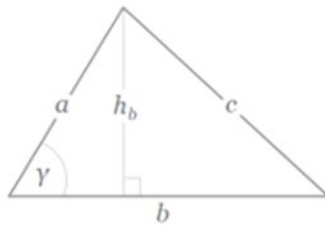
$$\text{Area} = wl$$



$$\text{Circumference} = 2\pi r$$

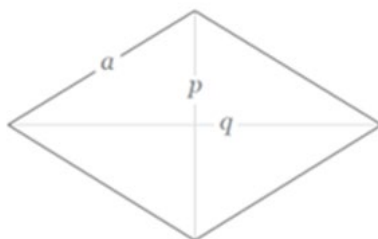
$$\text{Diameter} = 2r$$

$$\text{Area} = \pi r^2$$



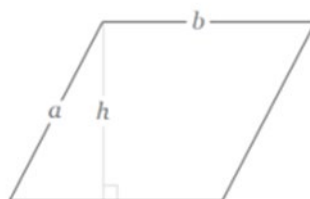
$$\text{Perimeter} = a + b + c$$

$$\text{Area} = \frac{h_b b}{2}$$



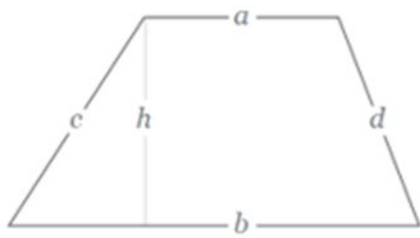
$$\text{Perimeter} = 4a$$

$$\text{Area} = \frac{pq}{2}$$



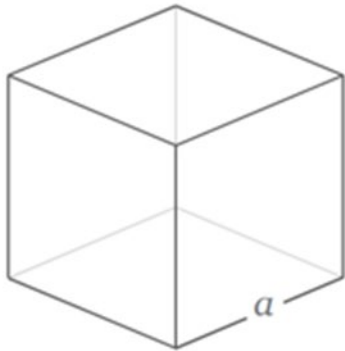
$$\text{Perimeter} = 2(a + b)$$

$$\text{Area} = bh$$



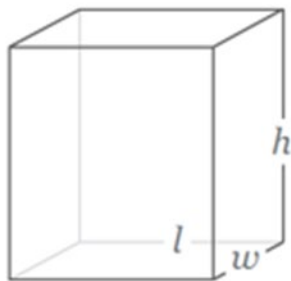
$$\text{Perimeter} = a + b + c + d$$

$$\text{Area} = \frac{a+b}{2}h$$



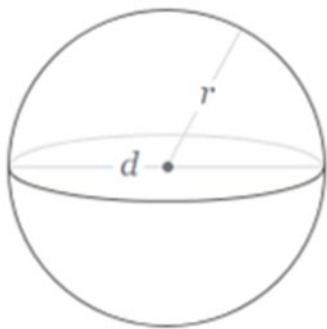
$$\text{Surface Area} = 6a^2$$

$$\text{Volume} = a^3$$



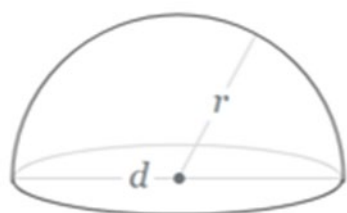
$$\text{Surface Area} = 2(wl + hl + hw)$$

$$\text{Volume} = whl$$



$$\text{Surface Area} = 4\pi r^2$$

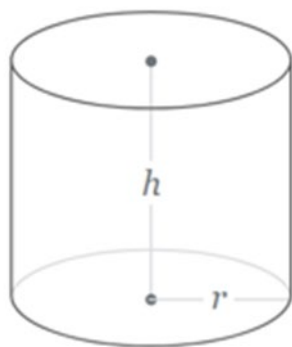
$$\text{Volume} = \frac{4}{3}\pi r^3$$



$$\text{Surface Area} = 3\pi r^2$$

$$\text{Curved Surface Area} = 2\pi r^2$$

$$\text{Volume} = \frac{2}{3}\pi r^3$$



$$\text{Surface Area} = 2\pi rh + 2\pi r^2$$

$$\text{Curved Surface Area} = 2\pi rh$$

$$\text{Volume} = \pi r^2 h$$

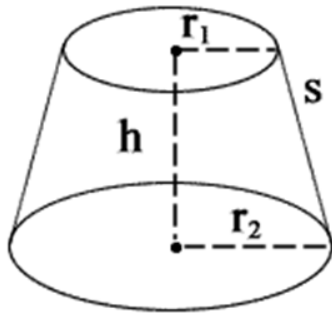


$$\text{Slant Height} = \sqrt{r^2 + h^2}$$

$$\text{Surface Area} = \pi r(r + \sqrt{h^2 + r^2})$$

$$\text{Curved Surface Area} = \pi r\sqrt{h^2 + r^2}$$

$$\text{Volume} = \pi r^2 \frac{h}{3}$$



$$\text{Slant Height} = \sqrt{(r_1 - r_2)^2 + h^2}$$

$$\text{Surface Area} = \pi(r_1^2 + r_2^2 + (r_1 + r_2) \times s)$$

$$\text{Curved Surface Area} = \pi \times (r_1 + r_2) \times s$$

$$\text{Volume} = \frac{1}{3} \pi h (r_1^2 + r_2^2 + (r_1 \times r_2))$$



$$\text{Surface Area} = lw + l\sqrt{\left(\frac{w}{2}\right)^2 + h^2} + w\sqrt{\left(\frac{l}{2}\right)^2 + h^2}$$

$$\text{Sloped Surface Area} = l\sqrt{\left(\frac{w}{2}\right)^2 + h^2} + w\sqrt{\left(\frac{l}{2}\right)^2 + h^2}$$

$$\text{Volume} = \frac{lw h}{3}$$

4. Calculus

$$y = ax^n \Rightarrow \frac{dy}{dx} = (a \times n)x^{(n-1)}$$

$$y = \sin(ax) \Rightarrow \frac{dy}{dx} = a \times \cos(ax)$$

$$y = \cos(ax) \Rightarrow \frac{dy}{dx} = -a \times \sin(ax)$$

$$y = ax^n \Rightarrow \int ax^n dx = \frac{ax^{n+1}}{n+1} + c$$

$$y = \sin(ax) \Rightarrow \int \sin(ax) dx = -\frac{1}{a} \cos(ax) + c$$

$$y = \cos(ax) \Rightarrow \int \cos(ax) dx = \frac{1}{a} \sin(ax) + c$$

5. Matrices

$$\begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix} \times \begin{pmatrix} j & k & l \\ m & n & p \\ q & r & s \end{pmatrix} = \begin{pmatrix} aj + bm + cq & ak + bn + cr & al + bp + cs \\ dj + em + fq & dk + en + fr & dl + ep + fs \\ gj + hm + iq & gk + hn + ir & gl + hp + is \end{pmatrix}$$

$$A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$$

$$|A| = ad - bc$$

$$A = \begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix}$$

$$|A| = a(ei - hf) - b(di - fg) + c(dh - eg)$$