

Grade 9 Cheat Sheet

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}, a \geq 0 \text{ and } b > 0$$

$$\text{FOIL: } (a + b) \cdot (c + d) = a \cdot c + a \cdot d + b \cdot c + b \cdot d$$

$$\text{Cross multiplication: } \frac{a}{b} = \frac{c}{d} \Rightarrow a \cdot d = b \cdot c$$

Exponent Rules

$$x^a \cdot x^b = x^{a+b}$$

$$\frac{x^a}{x^b} = x^{a-b}$$

$$(x^a)^b = x^{a \cdot b}$$

$$(x \cdot y)^a = x^a \cdot y^a$$

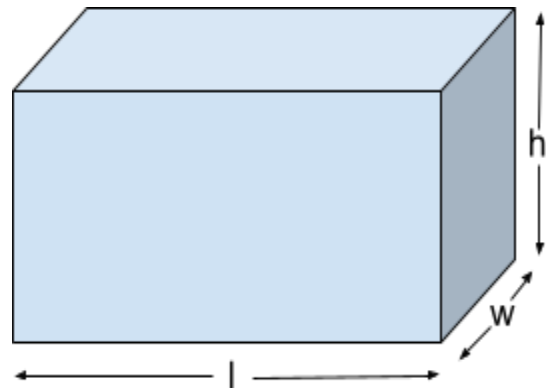
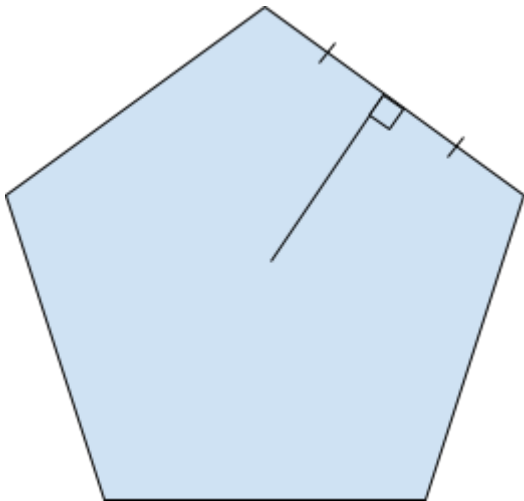
$$\left(\frac{x}{y}\right)^a = \frac{x^a}{y^a}$$

$$x^{\frac{a}{b}} = \sqrt[b]{x^a}$$

$$x^{-a} = \frac{1}{x^a}$$

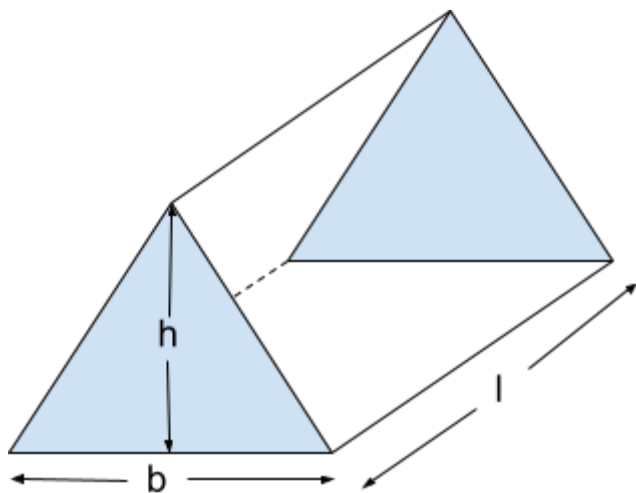
Geometry

Apothem - line segment connecting center of polygon with midpoint of a side (draw a few more examples)



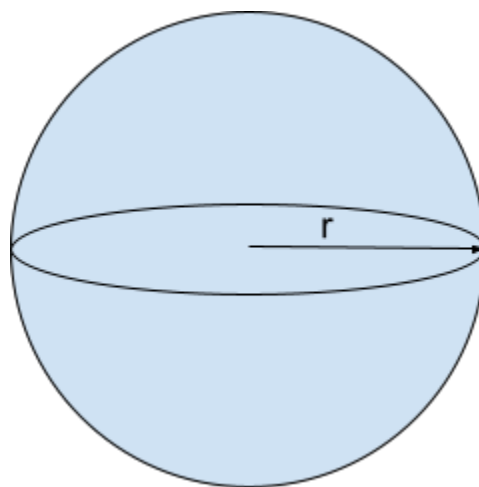
$$V = l \cdot w \cdot h$$

$$SA = l \cdot w + l \cdot h + w \cdot h$$



$$V = \frac{1}{3}b^2 \cdot h$$

$$SA = 2b \cdot s + b^2$$

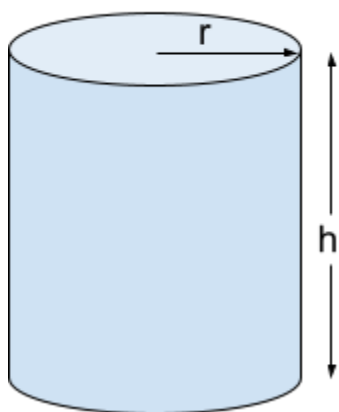


$$V = \frac{1}{2}b \cdot h \cdot l$$

$$SA = b \cdot h + 3b \cdot l$$

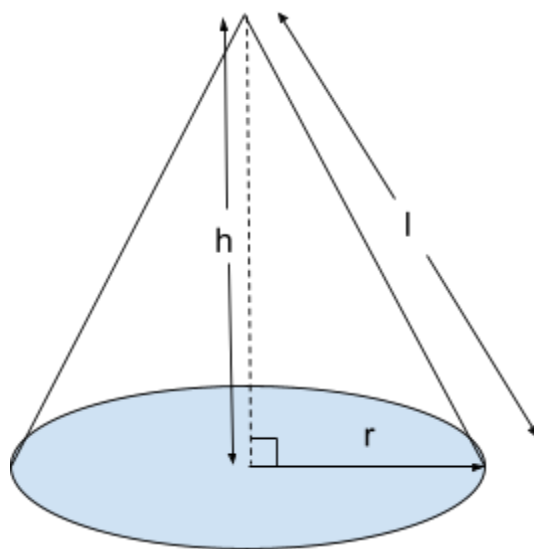
$$V = \frac{4}{3}\pi r^3$$

$$SA = 4\pi r^2$$



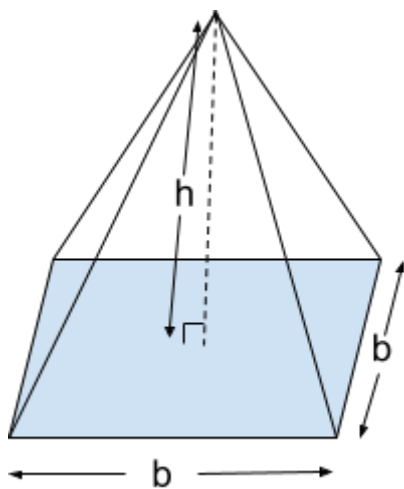
$$V = \pi r^2 \cdot h$$

$$SA = 2\pi r(h + r)$$



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

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



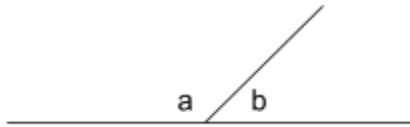
Linear Equations

Standard: $Ax + By + C = 0$

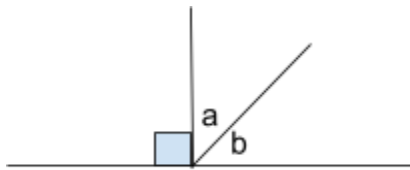
Slope y-intercept: $y = mx + b$

Point-slope: $(y - y_1) = m(x - x_1)$

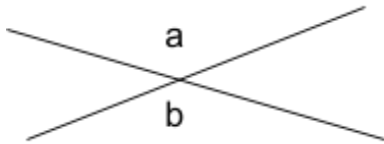
Angles



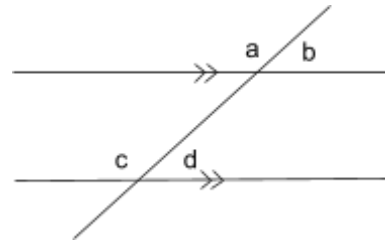
$$\angle a + \angle b = 180^\circ$$



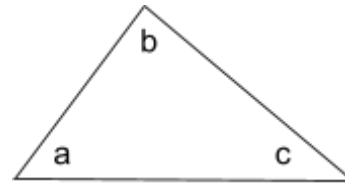
$$\angle a + \angle b = 90^\circ$$



$$\angle a = \angle b$$



$$\angle a = \angle c, \angle b = \angle d$$



$$\angle a + \angle b + \angle c = 180^\circ$$