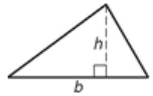
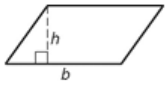
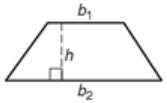
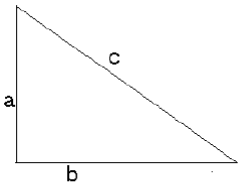
ACT Formulas to Know

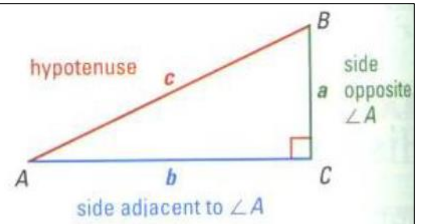
Figure	Diagram	Formula
Triangle		$A = \frac{1}{2}bh$
Parallelogram		$A = bh$
Trapezoid		$A = \frac{1}{2}(b_1 + b_2)h$ $*b_1 \;//\; b_2$

The **area of a regular polygon** with apothem *a* and perimeter *P* is:

$$A = \frac{1}{2}aP$$



Pythagorean Theorem: $a^2 + b^2 = c^2$



$$\sin\theta = \frac{\text{Opposite}}{\text{Hypotenuse}} = \frac{a}{c}$$

$$\cos\theta = \frac{adjacent}{\text{Hypotenuse}} = \frac{b}{c}$$

$$\tan\theta = \frac{\text{Opposite}}{adjacent} = \frac{a}{b}$$

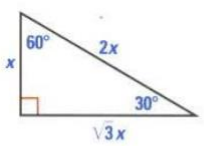
Circles

$Area = \pi r^2$

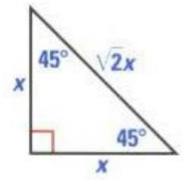
$Circumference = 2\pi r = \pi d$

Length of an arc: $S = \frac{\theta^\circ}{360^\circ}\pi d$

Name of Figure	Shape	Surface Area	Volume
Cone		$\pi rl + \pi r^2$	$\frac{1}{3}\pi r^2 h$
Pyramid		$\frac{1}{2}lp + B$	$\frac{1}{3}Bh$
Sphere		$4\pi r^2$	$\frac{4\pi r^3}{3}$
Cylinder		$2\pi rh + 2\pi r^2$	$\pi r^2 h$
Rectangular Prism		$2lw + 2lh + 2wh$	lwh
Prism		$lp + 2B$	Bh



Hypotenuse = 2 · shorter leg
Longer leg = √3 · shorter leg



Hypotenuse = √2 · leg

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

$$midpoint = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$y = mx + b$ (slope intercept form)

1) m=slope and b = y-intercept

2) slope=$m = \frac{y_2 - y_1}{x_2 - x_1}$

3) 2 lines are parallel if their slopes are the same $\left(m = \frac{2}{3} \text{ and } m = \frac{2}{3}\right)$

4) 2 lines are perpendicular $\perp$ if their slopes are opposites and reciprocals $\left(m = \frac{2}{3} \text{ and } m = \frac{-3}{2}\right)$

Algebra: Quadratic Formula
(Used to solve an equation involving x^2)

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

1. $a^m \cdot a^n = a^{m+n}$
2. $\frac{a^m}{a^n} = a^{m-n}$
3. $a^{m\ n} = a^{mn}$
4. $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$
5. $a^0 = 1$
6. $a^{-n} = \frac{1}{a^n}$