Pythagorean Triples

3 – 4 – 5 5 – 12 – 13 7 – 24 – 25

8 – 15 – 17 9 – 40 - 41

Special Right Triangles

30° - 60° - 90°
$x : x\sqrt{3} : 2x$

45° - 45° - 90°
$x : x : x\sqrt{2}$

Trigonometry

$$\sin\angle A = \frac{\text{opposite leg}}{\text{hypotenuse}}$$

$$\cos\angle A = \frac{\text{adjacent leg}}{\text{hypotenuse}}$$

$$\tan\angle A = \frac{\text{opposite leg}}{\text{adjacent leg}}$$

Coordinate Geometry

Given: Points $A(x_1, y_1)$ and $B(x_2, y_2)$

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

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

Slope of $\overleftrightarrow{AB} = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1}$

Circumference/ Area /Volume

Circle

$C = 2\pi r$

$A = \pi r^2$

Triangle

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

Cone

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

Sphere

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

Cylinder

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

Quadrilaterals

Parallelogram: $A = bh$

Square: $A = s^2$

Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$

Rectangle: $A = lw$

Quadrilateral with $\perp$ diagonals: $A = \frac{1}{2}d_1 d_2$