

# SAT PREP

## Unit wise SAT formula sheet

### Heart of Algebra

**Standard Form:**  $Ax + By = C$

**Point-Slope Form:**  $(y - y_1) = m(x - x_1)$

**Slope-Intercept Form:**  $y = mx + b$

**Slope of a Line:**  $m = \frac{y_2 - y_1}{x_2 - x_1}$

**Midpoint:**  $M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

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

**Average Velocity:**  $V_{avg} = \frac{\text{total distance}}{\text{total time}}$

### Problem Solving and Data Analysis

**General Form:**  $A = P(1 \pm r)^t$

**Continuous Growth/Decay:**  $A = Pe^{rt}$

**Compounding Growth/Decay:**  $A = P \left( 1 \pm \frac{r}{n} \right)^{nt}$

**Arithmetic Mean:**  $\frac{\text{Sum of the Terms}}{\text{Number of Terms}}$

**Percent Change:**  $\frac{\text{New} - \text{Old}}{\text{Old}} \times 100\%$

**Exclusive OR:**  $P(A \text{ or } B) = P(A) + P(B) - P(A \& B)$

**Conditional Probability:**  $P(A|B) = \frac{P(A \& B)}{P(B)}$

### Passport to Advanced Math

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

**Vertex of Parabola:**  $x = \frac{-b}{2a}$

**Equation of a circle with center (h, k) and radius r:**

$$(x - h)^2 + (y - k)^2 = r^2$$

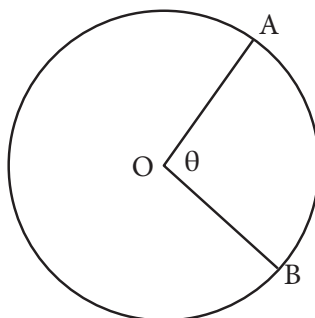
### Additional Topics in Math

**Area:**  $A = \pi r^2$

**Circumference:**  $C = 2\pi r$

**Arc length (in degrees):**  $L(A, B) = \frac{\theta}{360^\circ} \cdot 2\pi r$

**Sector Area (in degrees):**  $AOB = \frac{\theta}{360^\circ} \cdot \pi r^2$



**Parallelogram:**  $A = bh$

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

**Triangle:**  $A = \frac{1}{2}bh$

**Regular Polygon:**  $A = \frac{1}{2}aP$  or  $A = \frac{ns^2}{4\tan(\frac{180^\circ}{n})}$

**Cube:**  $SA = 6s^2$

**Cube:**  $V = s^3$

**Rectangular Prism:**  $V = lwh$

**Cylinder:**  $V = \pi r^2 h$

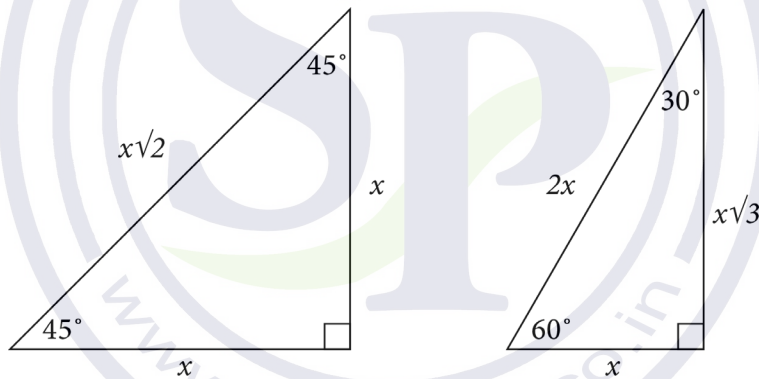
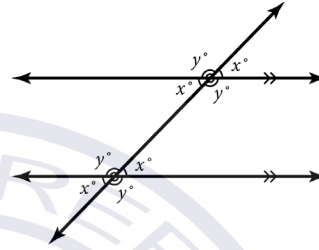
**Sphere:**  $V = \frac{4}{3}\pi r^3$

**Sum of Interior Angles:**  $= 180(n - 2)^\circ$

**Each Interior Angle:**  $= \frac{180(n - 2)^\circ}{n}$

**Sum of Exterior Angles:**  $= 360^\circ$

**Each Exterior Angles:**  $= \frac{360^\circ}{n}$



### Trig Ratios

$$\sin x = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos x = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan x = \frac{\sin x}{\cos x} = \frac{\text{opposite}}{\text{adjacent}}$$

$$\csc x = \frac{1}{\sin x} = \frac{\text{hypotenuse}}{\text{opposite}}$$

$$\sec x = \frac{1}{\cos x} = \frac{\text{hypotenuse}}{\text{adjacent}}$$

$$\cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x} = \frac{\text{adjacent}}{\text{opposite}}$$

### Pythagorean Identities

$$\sin^2 x + \cos^2 x = 1$$

$$\tan^2 x + 1 = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$