

## Suggested Formulas to know for the ACT

### General Formulas:

Mean (Averages):  $\frac{\text{Sum of the items}}{\text{Number of items}}$

Median: *The middle number when numbers are arranged in numerical order. If there is an even amount, find the mean of the two numbers in the middle.*

Mode: *The number that occurs most frequently*

Range: *Largest number – Smallest number*

Probability:  $\frac{\text{Desired outcomes}}{\text{Possible outcomes}}$

Percents:  $\frac{\text{is}}{\text{of}} = \frac{\%}{100}$

*Average Speed* =  $\frac{\text{total distance}}{\text{total time}}$

*Distance* = *rate* · *time*

### Algebra:

Slope between two points:  $m = \frac{y_2 - y_1}{x_2 - x_1}$  (given two points  $(x_1, y_1)$  and  $(x_2, y_2)$ )

Slope-Intercept Form:  $y = mx + b$  (where  $m$  is the slope and  $b$  is the y-intercept)

Midpoint:  $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$  (given two points  $(x_1, y_1)$  and  $(x_2, y_2)$ )

Quadratic Formula:  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$  ( $a$ ,  $b$ , and  $c$  come from  $y = ax^2 + bx + c$ )

Distance Formula:  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$  (given two points  $(x_1, y_1)$  and  $(x_2, y_2)$ )

### Geometry:

**( $l$  is length,  $w$  is width,  $h$  is height,  $r$  is radius,  $b$  is base)**

Perimeter of a Rectangle:  $P = 2l + 2w$

Area of a Rectangle:  $A = lw$

Area of a Parallelogram:  $A = lw$

Volume of a Rectangular Solid:  $V = lwh$

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

Area of a Triangle:  $A = \frac{1}{2}bh$

Pythagorean Theorem:  $a^2 + b^2 = c^2$  or  $leg^2 + leg^2 = hypotenuse^2$

Special Right Triangles:

Circumference of a Circle:  $C = 2\pi r$

Arc Length of a Sector:  $ArcLength = \frac{\text{radians of sector}}{2\pi} \cdot 2\pi r$  or  $ArcLength = \frac{\text{° of sector}}{360^\circ} \cdot 2\pi r$

Area of a Circle:  $A = \pi r^2$

Area of a Sector of a Circle:  $A = (\pi r^2) \left( \frac{\text{° of center}}{360^\circ} \right)$  or  $A = (\pi r^2) \left( \frac{\text{radians of center}}{2\pi} \right)$

Volume of a Cylinder:  $V = \pi r^2 h$

Equation of a Circle:  $(x - h)^2 + (y - k)^2 = r^2$

**Trigonometry:**

Sine:  $\frac{\text{opposite}}{\text{hypotenuse}}$

Cosine:  $\frac{\text{adjacent}}{\text{hypotenuse}}$

Tangent:  $\frac{\text{opposite}}{\text{adjacent}}$

Extra Formulas:  $\sin^2 \theta + \cos^2 \theta = 1$  and  $\frac{\sin \theta}{\cos \theta} = \tan \theta$