Formulas Most Often Needed on the ACT Math Section

Perimeter:

- Rectangle: P = 2l + 2w
- Square: P = 4s
- Triangle: P = a + b + c, a, b, and c are △ sides

Circumference:

$C = \Pi d = 2\Pi r$

Area:

- Rectangle: A = lw
- Triangle: $A = \frac{1}{2}bh$
- Circle: $A = \Pi r^2$
- Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$

Surface Area:

Right Cylinder: $SA = 2\Pi r^2 + 2\Pi rh$

Volume:

- Rectangle: V = lwh
- Cylinder: $V = \Pi r^2 h$

Log:

$log_a x = b \rightarrow a^b = x$

Equation of Circle:

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

center: (h, k) and radius = r

Midpoint:

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

Slope:

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

Distance:

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

Total Measure of Interior ∠ of N-Sided Polygon:

(n-2) 180°

Pythagorean Theorem:

$a^2 + b^2 = c^2$

Trigonometry:

$\sin x = \frac{opp}{hyp}$ $\cos x = \frac{adj}{hyp}$ $\tan x = \frac{opp}{adj}$

Trig Identities:

$\csc x = \frac{1}{\sin x}$ $\sec x = \frac{1}{\cos x}$ $\cot x = \frac{1}{\tan x}$

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

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

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

Law of Cosines (usually given on the test, but just in case…):

$c^2 = a^2 + b^2 - 2ab(\cos C)$

Law of Sines (usually given in words, but just in case…):

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

OR

$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Functions:

Even: f(-x) = f(x) → graph is symmetric about the y-axis

Odd: -f(x) = f(-x) → graph is symmetric about the origin (180° test)

Transformations:

f(x) = A sin (Bx - C) + D OR

f(x) = A cos (Bx - C) + D

Amplitude = |A|

Period = $\frac{2\Pi}{B}$

Vertical Shift = D (up if positive, down if negative)

Horizontal Shift = C/B (if "C/B" is positive, move to the right; if "C/B" is negative, move to the left; i.e., f(x) = A sin(Bx - C) + D will be shifted C/B units to the right