

ACT Math Formula Sheet

Rules of Exponents $x^m \cdot x^n = x^{m+n}$ $\frac{x^m}{x^n} = x^{m-n}$ $(x^m)^n = x^{mn}$ $x^0 = 1$ $x^{\frac{a}{b}} = \sqrt[b]{x^a}$ $x^{-1} = \frac{1}{x}$ $\frac{1}{x^{-1}} = x$ $4^{2x} = 8^{x+4}$ change to same base. Set exponents equal to each other and solve	Logarithm/Exponential $\log_b x = y \quad b^y = x \quad \text{LOG} = \log_{10} \quad \ln = \log_e$ $\log mn = \log m + \log n$ $\log \frac{m}{n} = \log m - \log n$ $\log m^n = n \log m$ Imaginary Numbers $i = \sqrt{-1} \quad i^2 = -1$	Sequences Arithmetic: $a_n = a_1 + (n-1)d$ Geometric: $a_n = a_1 \cdot r^{n-1}$ Arithmetic Sum: $S_n = \frac{n}{2}(2a_1 + (n-1)d)$ Absolute value Equation $ x+5 = 3$ $x+5 = 3 \quad x+5 = -3$
Matrices Add/Sub: Add/Sub corresponding locations Multiply: Row of first times column of second Determinant $\begin{bmatrix} a & b \\ c & d \end{bmatrix} = ad - bc$ To multiply, number of columns of first matrix must equal number of rows of second matrix	Uniform Motion Distance = rate x time Percent $\frac{\text{part}}{\text{whole}} = \frac{\text{percent}}{100} \quad \text{p\% of } x = \frac{p}{100}(x)$ Percent Change $\frac{\text{amount of change}}{\text{original amount}} \times 100\%$	Statistics Mean = $\frac{\text{sum}}{\text{count}}$ Mean of Frequency Distribution $\frac{\sum f \cdot x}{\sum f}$ Median: Least to greatest. Middle term Mode: Number that appears the most Range: Highest minus lowest Standard Deviation: Measure of variation
Probability $P(A) = \frac{\text{Favorable Outcomes}}{\text{Total Possible Outcomes}}$ $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $P(A \text{ and } B) = P(A) \cdot P(B)$ Expected Value: $\sum x \cdot P(x)$ Counting Principle: m x n to do both things. Combination: $nCr = \frac{n!}{r!(n-r)!}$ Permutation: $nPr = \frac{n!}{(n-r)!}$ Sum of Probability Distribution = 1 Given: Reduces total possible outcomes	Functions $f(3)$ set x=3 and evaluate Domain: The complete set of x values Range: The complete set of y values Domain Restrictions: 1) division by zero 2) square root of negative number 3) Logarithm of zero or negative number Vertical Asymptote Located at x values that cause division by zero Horizontal Asymptote $\frac{x}{x^2} : y = 0 \quad \frac{ax^2}{bx^2} : y = \frac{a}{b} \quad \frac{ax^2}{bx} : \text{none/slant}$	Composition of Functions $f(g(2))$ means to plug in 2 for x in the g(x) function then plug that result into the f(x) function $f(g(x))$ means to replace the x's in the f(x) with g(x) $f(g(x)) = 0$ means to find the x value that makes the composite function equal to zero
Function Translations $f(x) + c$ shift up $f(x) - c$ shift down $f(x + c)$ shift left $f(x - c)$ shift right $-f(x)$ reflection about x axis $f(-x)$ reflection about y axis	Linear Functions Slope = $\frac{y_2 - y_1}{x_2 - x_1}$ Slope-Intercept Form: $y = mx + b$ Distance Formula: $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ Midpoint: $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$ Parallel: Same Slope Perpendicular: Negative Reciprocal	Parabolas/Quadratics Standard Form: $y = ax^2 + bx + c$ Vertex Form: $y = a(x - h)^2 + k$ Intercept Form: $y = a(x - p)(x - q)$ Find vertex: $h = -\frac{b}{2a} \quad k = f(-\frac{b}{2a})$ If a positive, it's upward otherwise downward Sum of solutions = $-\frac{b}{a}$
Trig Functions $y = A \sin(Bx) + D$ A = Amplitude D = Vertical Shift Period = $\frac{2\pi}{B}$ π radians = 180°	Trig Identities $\sin^2(\theta) + \cos^2(\theta) = 1$ $\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)} \quad \sin(\theta) = \cos(90 - \theta)$ $\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)} \quad \cos(\theta) = \sin(90 - \theta)$ $\sec(\theta) = \frac{1}{\cos(\theta)} \quad \csc(\theta) = \frac{1}{\sin(\theta)}$	Quadratic Formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ Discriminant Rules $b^2 - 4ac > 0$ Two real roots $b^2 - 4ac = 0$ One real root $b^2 - 4ac < 0$ Two imaginary roots
Binomial Expansion $(x + y)^n = \sum_{k=0}^n \binom{n}{k} x^k y^{n-k}$ Pascal's Triangle or Combination Circle Arc Circle Sector $\frac{x}{360} \cdot \text{Circumference}$ $\frac{x}{360} \cdot \text{Area}$ where x = Central Angle	Geometry Midpoint: $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$ Isosceles Triangle: Two sides congruent and corresponding angles congruent Pythagorean Theorem: $a^2 + b^2 = c^2$ Pythagorean Triplets: 3-4-5, 6-8-10, 5-12-13 Triangle: Interior angles sum is 180	Perimeter Circle: $2\pi r = \pi d$ Area Rectangle: L x W Triangle: $\frac{1}{2}bh$ Triangle: $A = \frac{1}{2}absinC$ Circle: πr^2 Trapezoid: $\frac{1}{2}h(b_1 + b_2)$
Parallelogram Properties - Opposite sides parallel - Opposite sides congruent - Opposite angles congruent - Consecutive angles add up to 180 - Diagonals bisect one another	SOHCAHTOA $\text{sine} = \frac{\text{opposite}}{\text{hypotenuse}} \quad \text{cosine} = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\text{tangent} = \frac{\text{opposite}}{\text{adjacent}}$ System of Linear Equations One Solution: Difference Slopes Multiple Solutions: Same slope and y-intercept No Solutions: Same slope different y-intercepts	Special Right Triangles 30-60-90: $x, x\sqrt{3}, 2x$ 45-45-90: $x, x, x\sqrt{2}$ Circle: $(x - h)^2 + (y - k)^2 = r^2$ Ellipse: $\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$ Law Of Sines: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ Law of Cosines: $c^2 = a^2 + b^2 - 2ab \cos C$

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Instructor: Lydia Terry

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WE WILL COVER 3 MATH TESTS

Learn the equations, fastest methods, calculator functions to solve the questions.

ACT Virtual Group Session

Date: TBD

Time: TBD

Cost: \$37 per person

1. The blood types of 150 people were determined for a study in order to be typed below.

2. On a particular road map, $\frac{1}{2}$ inch about how many miles apart as $2\frac{1}{2}$ inches apart on this map?

3. Given $f(x) = x^2$, $f(x) = 48$, and $d = 16$.

Website

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