

ALEKS Math Placement Cheat Sheet 2026

The night-before summary, built like the exam.

— Questions	— Time limit	Scored 0-100; cut scores... Passing score
— Exam fee	McGraw Hill (ALEKS) Governing body	

Percents & Proportions

- Percent change: $(\text{new} - \text{old}) / \text{old} \times 100$. Always divide by the original value.
- Percent of a number: rate as a decimal $\times$ base. 35% of 240 = $0.35 \times 240 = 84$.
- Original price after discount: $\text{original} = \text{final} \div (1 - \text{rate})$. Paid 68 after 20% off: $68 \div 0.80 = 85$.
- Proportion: $a/b = c/d$ means $ad = bc$. Pair each numerator with the opposite denominator.
- Successive percents multiply: 12% off then 8% tax = $\times 0.88 \times 1.08$, never a flat -4%.

Geometry

- Rectangle: $A = lw$, $P = 2(l + w)$. Triangle: $A = (1/2)bh$, angles sum to 180.
- Circle: $A = r^2$, $C = d = 2r$. Square the radius, not the diameter.
- Box: $V = lwh$. Cylinder: $V = r^2h$.
- Pythagorean theorem: $a^2 + b^2 = c^2$. Triples: 3-4-5, 5-12-13, 8-15-17.
- Complementary angles sum to 90; supplementary to 180.

Linear Equations & Lines

- Slope: $m = (y_2 - y_1)/(x_2 - x_1)$. Slope-intercept: $y = mx + b$. Point-slope: $y - y_1 = m(x - x_1)$.
- Parallel: equal slopes. Perpendicular: slopes multiply to -1 (negative reciprocals).
- Intercepts: x-intercept sets $y = 0$; y-intercept sets $x = 0$.
- Inequality flip: reverse the sign only when multiplying or dividing by a negative.
- Absolute value: $|X| = k$ ($k > 0$) splits into $X = k$ or $X = -k$.

Exponent Laws

- $x^a \cdot x^b = x^{(a+b)}$; $x^a \div x^b = x^{(a-b)}$; $(x^a)^b = x^{(ab)}$.
- $x^0 = 1$ ($x \neq 0$); $x^{(-n)} = 1/x^n$; $x^{(m/n)} = (\text{nth root of } x)^m$. $16^{(3/4)} = 8$.
- $(2a^3)^4 = 16a^{12}$: raise every factor, multiply the exponents.

Factoring Patterns

- Difference of squares: $a^2 - b^2 = (a - b)(a + b)$.
- Perfect square: $(a \pm b)^2 = a^2 \pm 2ab + b^2$. Never drop the middle term.
- Trinomial $x^2 + bx + c$: find two numbers with product c and sum b .
- Always pull the GCF first: $2x^2 + 10x + 12 = 2(x + 2)(x + 3)$.

Quadratics, Exponentials & Logs

- Quadratic formula: $x = (-b \pm (b^2 - 4ac)) / (2a)$.
- Discriminant $b^2 - 4ac$: positive $\rightarrow$ 2 real roots; zero $\rightarrow$ 1; negative $\rightarrow$ none.
- Vertex: $x = -b/(2a)$; substitute back for y .

- Log meaning: $\log_b(x) = y$ means $b^y = x$.
- Log rules: $\log(ab) = \log a + \log b$; $\log(a/b) = \log a - \log b$; $\log(a^n) = n \log a$.
- Same-base equations: $b^m = b^n$ forces $m = n$. Check log arguments stay positive.

Trigonometry

- SOH-CAH-TOA: $\sin = \text{opp/hyp}$, $\cos = \text{adj/hyp}$, $\tan = \text{opp/adj}$.
- Special values: $\sin 30 = 1/2$, $\cos 30 = \sqrt{3}/2$, $\sin 45 = \cos 45 = \sqrt{2}/2$, $\tan 45 = 1$, $\sin 60 = \sqrt{3}/2$, $\cos 60 = 1/2$.
- Radians: $\text{degrees} \times \pi/180$; $180^\circ = \pi$; $150^\circ = 5\pi/6$.
- Identity: $\sin^2 + \cos^2 = 1$, so $1 - \cos^2 = \sin^2$.
- Quadrant signs: all positive in QI; $\sin$ in QII; $\tan$ in QIII; $\cos$ in QIV.

Official sources

- McGraw Hill (ALEKS) — ALEKS Placement, Preparation and Learning (PPL):
<https://www.mheducation.com/highered/aleksppl.html>
- University of Illinois Urbana-Champaign Department of Mathematics — ALEKS PPL Mathematics Assessment Exam:
<https://math.illinois.edu/academics/undergraduate/ALEKS>
- University of Kansas Department of Mathematics — Taking the Placement Assessment (ALEKS Math Placement):
<https://math.ku.edu/taking-placement-assessment>

Free practice questions for this exam: www.everyexamprep.com/exams/aleks-math-placement/practice-test