

Algebra 1 curriculum: the eleven units and their skills

The Algebra 1 course as US schools teach it, in the usual order. Tick a unit when the student can do its skills without notes; the state end-of-course exams (Florida, Texas, New York, Virginia) test all eleven.

Unit	Skills	Weeks	Done
1. Expressions and the real numbers	Order of operations; variables and expressions; properties of real numbers; rational and irrational numbers; evaluating and simplifying	2	[]
2. Solving linear equations	One-step to multi-step; variables on both sides; no solution and infinitely many; literal equations; ratio and proportion	3	[]
3. Linear inequalities	Solving and graphing; reversing the sign; compound inequalities; absolute value equations and inequalities	2	[]
4. Linear functions and graphs	Functions, domain and range, $f(x)$; slope as rate of change; slope-intercept, point-slope, standard form; parallel and perpendicular; scatter plots	4	[]
5. Systems of equations and inequalities	Graphing, substitution, elimination; no solution and infinitely many; word problems; graphing linear inequalities and systems	3	[]
6. Exponents and exponential functions	Laws of exponents including rational exponents; exponential growth and decay; linear vs exponential; geometric sequences	3	[]
7. Polynomials	Adding, subtracting, multiplying; special products	2	[]
8. Factoring	GCF; trinomials with leading coefficient 1 and other; difference of squares; perfect squares; grouping; solving by factoring	3	[]
9. Quadratic functions and equations	Parabolas from standard, vertex and factored form; vertex, axis, intercepts; transformations of $y = x^2$; solving by factoring, square roots, completing the square, the formula; the discriminant	4	[]
10. Radicals and sequences	Simplifying square roots; operations with radicals; inverse variation; arithmetic and geometric sequences	2	[]
11. Statistics	Dot plots, histograms, box plots; centre and spread; two-way tables; scatter plots, correlation, line of fit	2	[]

Tests, and the fifteen-question readiness check

State end-of-course exams

State	Test	What rides on it
Florida	Algebra 1 EOC (B.E.S.T.)	30% of the grade; required for a standard diploma
Texas	STAAR Algebra I EOC	Required for graduation; 20 of 59 points to pass, 32 for Meets
New York	Regents Algebra I	A Regents math exam is required for the diploma
Virginia	Algebra I SOL	Verified credit

Readiness: the grade 7 and 8 skills Algebra 1 assumes

- $2/3 + 3/4$
- $1 \frac{1}{2} \div 3/8$
- $-3 - (-5)$
- $(-2)(-7)$
- -4^2
- 20% rise then 20% fall: what % of the start?
- Solve $3x - 7 = 11$ and say why you add 7 first
- 'Five less than twice a number' as an expression
- Unit rate: 240 miles in 4 hours
- Simplify $4(x + 3) - 2x$
- Evaluate $2a^2 - b$ for $a = 3$, $b = 5$
- Slope between (1, 2) and (4, 11)
- Solve $y/5 = 7$
- Order: -2.5 , -3 , 0.4 , $-1/2$
- 15 is what percent of 60?

Answers

- 1) $17/12$ 2) 4 3) 2 4) 14 5) -16 6) 96% 7) $x = 6$; undo subtraction before multiplication 8) $2n - 5$ 9) 60 mph 10) $2x + 12$
 11) 13 12) 3 13) 35 14) -3 , -2.5 , $-1/2$, 0.4 15) 25%

13 or more: ready. 9 to 12: close two gaps in the summer. 8 or fewer: a term of Pre-Algebra first is worth a year.

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