

The following skills are recommended, self-guided, SUMMER WORK resources for all students scheduled to take **Math Analysis**. Please plan to spend some quality time this summer practicing these skills. We recommend you pace yourself and do not leave it all until the last week.

Below is the list of recommended Khan Academy tutorials, the second page are the skills students should be proficient in by the first day of school. There will be an assessment of this material the first week of school.

<https://www.khanacademy.org>; click **COURSES** (upper left); click **MATH**; scroll down & click **Algebra I**

1. Algebra Foundations (all skills)
2. Solving Equations and Inequalities (all skills)
3. Linear Equations and Graphs (all skills)
4. Forms of Linear Equations (all skills)
5. Systems of Equations – all skills except word problems
6. Inequalities (systems and graphs) – checking solutions of two-variable inequalities and graphing two-variable inequalities.
7. Functions – evaluating functions, inputs & outputs, functions & equations, & recognizing functions
8. Exponents and Radicals (all skills)
9. Quadratics: Multiplying and Factoring (all skills)
10. Quadratic Functions and Equations
 - a. Intro to Parabolas
 - b. Solving and Graphing with Factored form
 - c. Solving by Taking the Square root
 - d. Vertex Form
 - e. Solving Quadratics by Factoring
 - f. The Quadratic Formula
11. Irrational Numbers – irrational numbers, sums, and products of rational and irrational numbers

Once your student has completed these, return to the **MATH** menu, scroll down & click **Algebra II**, then complete the following:

1. Polynomial Arithmetic (all skills except Average Rate of Change of Polynomials)
2. Complex Numbers (all skills except the Complex Plane)
3. Polynomial Factorization
 - a. Factoring monomials
 - b. Greatest Common Factor
 - c. Taking Common Factors
 - d. Factoring Higher Degree Polynomials
4. Polynomial Division (all skills)
5. Polynomial Graphs – zeros of polynomials and end behavior of polynomials
6. Rational Exponents and Radicals (all skills)
7. Logarithms – all skills except solving exponential models.
8. Equations
 - a. Rational Equations
 - b. Square-root Equations
 - c. Extraneous Solutions
 - d. Cube-root Equations
9. Rational Functions
 - a. Cancelling Common Factors
 - b. Multiplying and Dividing Rational Expressions
 - c. Adding and Subtracting Rational Expressions Intro
 - d. Adding and Subtracting Rational Expressions (factored)
 - e. Adding and Subtracting Rational Expressions (not factored)

Student SUPPLIES NEEDED FOR Math Analysis 2024-25: No textbook required, Graph Paper (if desired), Loose-leaf paper, pencils, 1-2" Binder.

Teacher Wish List: loose-leaf paper, wide-tip black dry erase markers, and Lysol spray and/or wipes.

“An investment in knowledge always pays the best interest.” - Benjamin Franklin

Solve each of the following equations or inequalities, leave answers in simplest form.

1 $\frac{3}{4}x + 16 = 2 - \frac{1}{8}x$ $x =$ _____

2 $6(x + 2) - 4 = -10$ $x =$ _____

3 $6(x - 5) = 18 - 2x$ $x =$ _____

4 $3(2x + 25) - 2(x - 1) = 78$ $x =$ _____

5 $\frac{5}{8} + \frac{3}{4}x = \frac{1}{16}$ $x =$ _____

6 $5(2x - 6) - 7(x + 7) > 4x$ _____

Solve each of the following for slope-intercept form: $y = mx + b$

7 $2(x + y + 1) = 4y$ _____

8 $5x - 3y + 2 = 14 - 4x$ _____

Write an equation in slope-intercept form for each of the following:

9 **$(-3, -1)$, $m = -\frac{2}{3}$** _____

10 **$(-5, 1)$, $m = -\frac{3}{2}$** _____

11 **$(2, -2)$ and $(3, 2)$** _____

12 **x-int = -3, y-int = 4** _____

13 contains (4,6) parallel to $3y - 2x = 15$ _____

14 contains (2, -5) perpendicular to **$y = \frac{1}{4}x + 7$** _____

Factor (if possible) and solve each of the following completely (identify the factors and the solutions).

15 $x^2 - 5x - 6 = 0$ _____

16 $x^2 = 18 - 7x$ _____

17 $3x^2 + 18x = 21$ _____

18 $8x^2 = 6x + 9$ _____

19 $x^2 - 4x + 8 = 0$ _____

20 $x^2 - 10x = 1$ _____

21. $7x^2 - 6x + 10 = 0$ _____

22. $x^3 - 64 = 0$ _____

For 23-31: Simplify each expression completely.

23. $2(-2x)^3$ _____ 24. $\frac{-y^5z^7}{y^8z^5}$ _____

25. $\frac{-12m^4n^8(m^3n^2)}{36m^5n^{12}}$ _____

26. $\frac{80^{\frac{1}{2}}}{16^{\frac{1}{2}}}$ _____ 27. $(\sqrt[3]{7} \cdot \sqrt[4]{7})^2$ _____

28. $\frac{x^{\frac{3}{4}}}{x^{\frac{3}{8}}}$ _____ 29. $\sqrt[6]{9xy^6} \cdot \sqrt[6]{6x^{12}}$ _____

30. $\frac{x^2-x-20}{x+4} \div \frac{x^2-2x-15}{x-3}$ _____

31. $\frac{2x+1}{x^2-4} + \frac{5}{x-2}$ _____

32. Expand the following: $\log \sqrt{9x}$ _____

33. Condense the following: $5\log_4 3 + 6\log_4 x + 7\log_4 y$ _____

Solve each of the following:

34. $\frac{4x}{x-1} = \frac{x}{x^2-1}$ _____

35. $\frac{x}{4} + \frac{1}{2} = 5$ _____