

Math Analysis Summer Packet 2020-2021

As you begin Math Analysis, there are certain skills you learned over the previous years that you should already understand well. If you do not have these skills fully developed, you will find that you will consistently get problems incorrect next year, even though you may understand the Algebra concepts. I assume you already have basic skills in algebra. The ability to solve equations, work with algebraic expressions, and basic factoring should be easy for you by now. It is always important to refresh and practice. There is a lot of material to cover before we start pre-calculus in the next school year after the one beginning in August. You will need to review these topics on your own this summer as well as when we return to school in the fall. This summer assignment is designed to help you review/relearn those topics.

Please do not wait until the last minute to complete the summer assignment. There are many problems to solve and it is important to take your time understanding each of them. At the same time, please do not finish the whole packet in the beginning of the summer. The point of this assignment is to refresh your memory of skills needed in the course and if you do all the work early, you may forget again before school starts.

The packet is due on the first Friday of the new school year, no exceptions. If you turn in the assignment late, it will result in points off your grade for completion. The entire packet will be graded for correctness and completeness. It is considered a summative grade. I expect your work to be shown neatly with answers clearly labeled. Try to put your answers on the line provided and circle or box answers, when necessary. Legibility and understandability are important. If I cannot find each answer or if your work is illegible, you will receive no credit for the problem. Since I will not be able to monitor how you complete your packet, it is fine if you use a calculator. However, all answers should be exact answers (fraction or radical form). Keep in mind that most of our tests and quizzes do not allow a calculator to be used, so don't rely too heavily on one. I expect the work to be done by you and you alone, you may not work with others to complete this packet.

I look forward to working with each of you in the fall. Good luck and have a great summer!

Accuracy

— 15

Completion

— 15

SECTION 1 (Linear Equations, Absolute Value)

Solve for x .

_____ 1. $-4(x-2) + 2(x+1) = 7$

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

_____ 3. Solve for y in terms of x . $4xy - 3y = 12$

_____ 4. $-5 \leq 3x - 2 \leq 7$

_____ 5. $|2x + 6| > 18$

SECTION 2 (Piecewise Functions, Writing Equations)

_____ 6. Solve the system of equations:
 $5x + 3y = 4$
 $2x - y = -5$

_____ 7. Solve the system of equations:
 $5x + 6y = -9$
 $-x - 8y = -5$

_____ 8. Evaluate the function for the given value of x . $f(x) = \begin{cases} 3x^2 - 6, & x > 3 \\ \frac{1}{2}x + 5, & x \leq 3 \end{cases}$

a. $f(-4) =$ _____

b. $f(-3) =$ _____

c. $f(-1) =$ _____

_____ 9. Write the equation of the line perpendicular to $y = -3x + 10$ and passes through the point $(6, 12)$.

SECTION 3 (Factoring)

Factor the following polynomials completely

_____ 10. $x^2 + 7x - 18$

_____ 12. $27x^3 + 8$

_____ 11. $36x^2 - 24x + 4$

_____ 13. $3x^3 - 15x^2 + 2x - 10$

SECTION 4 (Quadratic Equations)

Solve for x .

_____ 14. $6x^2 = -13x + 5$

_____ 15. $-(x-2)^2 - 15 = -33$

_____ 16. $7x^2 - 2x + 2 = 5x^2 + x$

_____ 17. $x^2 + 6x = 27$ (complete the square)

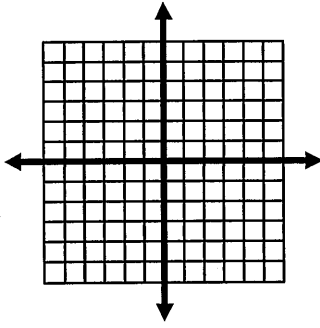
_____ 18. $x^2 - 4x = 2$ (complete the square)

_____ 19. $x^2 + x = 3$ (complete the square first)

SECTION 5 (Graphing)

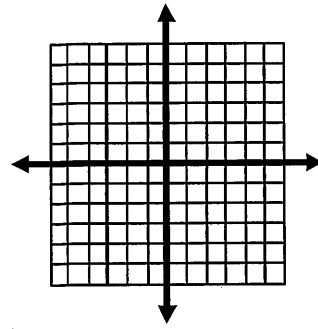
_____ 20. Graph the given function:

$$f(x) = -(x-2)^2 + 3$$



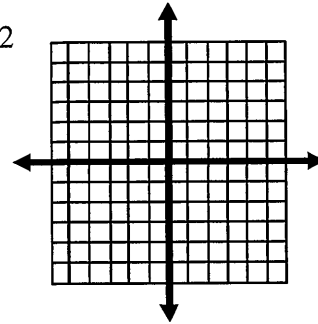
_____ 21. Graph the given function:

$$3x - 6y = 12$$



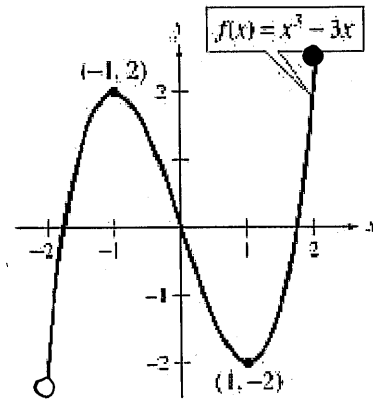
_____ 22. Graph the given function:

$$f(x) = \begin{cases} 2x - 3, & x \leq 2 \\ -x + 4, & x > 2 \end{cases}$$



_____ 23. Find the following information:

- a. Domain: _____
- b. Range: _____
- c. Increasing Intervals: _____
- d. Decreasing Intervals: _____



SECTION 6 (Radical Equations and Exponents)

Solve for x .

_____ 24. $\sqrt{2x+3} = 6$

_____ 25. $7(x+5)^{\frac{1}{3}} + 8 = 29$

_____ 26. $3x^{\frac{3}{4}} = 192$

Simplify the following expressions.

_____ 27. $(x^3)(x^4)$

_____ 28. $(2)(5^x) + (3)(5^x)$

SECTION 7 (Rational Expressions and Equations)

Simplify the following expressions.

_____ 29. $\frac{x^2 + 2x - 3}{x + 2} \cdot \frac{x^2 + 2x}{x^2 - 1}$

_____ 30. $\frac{2x}{x + 2} + \frac{7}{x^2 - 4}$

_____ 31. $\frac{\frac{x^2 - 4x}{x - 2}}{\frac{x^2 - 16}{2x - 4}}$

Solve for x .

_____ 32. $\frac{3}{x} - \frac{2}{x + 1} = \frac{4}{x}$

_____ 33. $\frac{2}{x - 3} = \frac{3}{x + 1}$

SECTION 8 (Trigonometry)

_____ 34. Find the complement of $\frac{5\pi}{14}$

_____ 35. Find the supplement of $\frac{9\pi}{16}$

