

Pre-Calculus Summer Assignment

This assignment is to be completed and turned in on the FIRST day of class. This will be graded. If you are not sure how to do some of the problems, you may consult someone or go to an online site for assistance. All work should be shown to support your answers. Answers should be clearly marked. You do not need to print this paper. You may do all work on loose leaf or notebook paper.

Students entering this class are expected to know concepts learned in Algebra 1, Geometry, and Algebra 2. These concepts will be briefly reviewed in class. These include but are not limited to:

Operations and Properties of Real Numbers

Solving linear and quadratic equations

Transformations of parent functions

Solving systems of equations and inequalities

Matrix operations

Simplifying radicals (including rationalizing) and solving radical equations

Operations with imaginary numbers

Rules of exponents

Basic geometry

Sets of numbers

Slope, equations of lines, distance formula

PART I: Simplify (NO decimal answers)

1) $(-2 + 4i) + (5 - 4i)$

2) $(5 + 3i)(2 + 6i)$

3) $\frac{5+i}{6+i}$

4) $\sqrt[3]{-27x^9}$

5) $\left(2x^{\frac{1}{4}}y^{\frac{1}{3}}\right)\left(3x^{\frac{1}{4}}y^{\frac{2}{3}}\right)$

6) $\sqrt[8]{8y^{16}}$

7) $\sqrt{20x^{16}}$

8) $\sqrt[6]{128b^4}$

9) $\frac{\sqrt[4]{27}}{\sqrt[3]{81}}$

10) $\sqrt[3]{-250x^{11}y^6z^5}$

11) $\frac{-1-\sqrt{2}}{1+\sqrt{2}}$

12) $\frac{2}{\sqrt{2}}$

PART II: Solve

13) $5x^2 + 5 = 0$

14) $2x^2 + 12 = 0$

15) Use Quad Formula:
 $x^2 - 5x + 9 = 0$

16) Use Quad Formula:
 $x^2 - 6x + 13 = 0$

17) Solve by Completing the Square:
 $x^2 - 3x - 88 = 0$

18) Solve by Completing the Square:
 $3x^2 - 12x = -4$

19) Solve by Factoring:
 $x^2 + 6x - 16 = 0$

20) Solve by Factoring:
 $4x^2 + 19x - 5 = 0$

21) Solve by graphing on graph paper:
 $y = 5x - 2$
 $y = -2x + 5$

22) Solve using Substitution method:
 $4x - 5y = 6$
 $x + 3 = 2y$

23) Solve using Elimination method:
 $2x + 3y = 3$
 $12x - 15y = -4$

24) Solve using the method of your choice:
 $x + 2y + 3z = 5$
 $3x + 2y - 2z = -13$
 $5x + 3y - z = -11$

25) Solve by graphing on graph paper:
 $y \leq -x + 8$
 $y \geq 0.5x - 4$

PART III: Relations and functions.

Find the function value given $f(x) = \frac{4x+11}{3x^2+5x+1}$

26) $f(-6) =$

27) $f(4t) =$

Find the function value given $g(x) = 16 - \frac{12}{2x+3}$

28) $g(-3) =$

29) $g(6x) =$

State the domain of the function using Interval Notation. If not familiar with interval notation, then use set-builder notation.

30) $f(x) = 4x - 7$

31) $g(x) = x^2 + x - 12$

32) $h(x) = \sqrt{5 - x}$

33) $p(x) = \frac{8x+12}{x^2+5x+4}$

Which of the following are functions?

34) $f(x) = \frac{5}{x-6}$

35) $g(x) = \sqrt{x+4}$

36) $h(x) = 20x^2 + 20y^2 - 25$

37) What is another term for zeros of the function?

38) In a polynomial function of degree 5, what is the maximum number of extrema that could be possible?

39) True/False

Every function has an inverse.

40) True/False

Every inverse is a function.