Dear Incoming Honors Precalculus Student,

Welcome to Honors Precalculus!! As a student in Honors Precalculus, you will be expected to routinely use and apply the concepts and skills you learned in Algebra 1, Geometry, and, most importantly, Algebra 2. The following summer assignment is designed to help you retain the skills you need to be successful in Honors Precalc.

This summer assignment contains 75 practice problems. Please do all of the problems, and make sure to show your work. Make note of any problems you cannot answer. If you find you need more practice, you can always do some problems multiple times.

We will review the summer assignment material and answer any of your questions during the first few days of school. There may also be an assessment covering this material toward the end of the first week of school.

One other note - we will routinely use a graphing calculator in this course. So, we strongly recommend that you have your own graphing calculator which you bring to class every day. The TI-84 Plus CE will be used for demonstration during classroom instruction, and, though that particular model is not required, it is the model most students choose.

Now, have a terrific summer, and we will see you in August!

Your Honors Precalculus Teachers

Honors PreCalculus Name_____ ID: 1

Summer Assignment

Factor each completely.

1) $m^2 + 10m + 25$

2) $3p^2 + 24p + 36$

3) $9x^2 - 65x + 14$

4) $6x^2 - 23x + 20$

Factor each.

5) $x^4 + 2x^2 - 35$

6) $x^4 - 14x^2 + 49$

7) $x^4 - 3x^2 - 54$

8) $x^2 - 5x + 4$

9) $x^3 - 4x^2 - 42x$

10) $x^3 + 6x^2 + 10x$

11) $x^4 - 4x^3 - 5x^2$

12) $x^2 + 3x - 4$

13) $x^2 + 5x + 6$

14) $x^3 + x^2 - 5x - 5$

Solve each equation.

15) $n^2 + 55 = 16n$

16) $13v^2 - 18v - 47 = 4v^2$

17) $8x^2 - 28 = -1 + 16x$

18) $-9a^2 - 92 = 14a + 3 - 10a^2$

Evaluate each function.

19) $g(x) = 2 \cdot 3^{x+1}$; Find $g(-1)$

20) $k(x) = x^2 - 5x$; Find $k(8)$

21) $h(n) = 2n - 4$; Find $h(-9)$

22) $p(x) = x^2 - 3x$; Find $p(6)$

23) $f(a) = -|3a + 1| - 3$; Find $f(-7)$

24) $w(n) = n^2 - 3n$; Find $w(-7)$

Perform the indicated operation.

25) $h(x) = 4x + 4$
$g(x) = x^2 + 2x$
Find $h(x) - g(x)$

26) $h(x) = 3x + 5$
$g(x) = x^3 + 5x^2$
Find $h(x) \div g(x)$

27) $f(n) = n^2 - 3 - n$
$g(n) = -2n - 1$
Find $f(n) + g(n)$

28) $g(x) = 3x + 5$
$h(x) = x^2 + 4x$
Find $g(x) \cdot h(x)$

29) $h(x) = 4x + 1$
$g(x) = 3x + 5$
Find $h(g(x))$

30) $g(x) = x^2 + 3$
Find $g(g(x))$

Simplify.

31) $(-5 + 8i)(-7 + 3i)$

32) $(-2 + i)^2$

33) $(3i)(-7 - 7i) - 4(-8 - 7i)$

34) $-8(7i) + (7i)(4 - 7i)$

35) $(7+i)(4-5i)$

36) $(-2-8i)(-1+2i)$

37) $\dfrac{5}{6-7i}$

38) $\dfrac{10-5i}{4+9i}$

39) $\sqrt{2}(-\sqrt{2}+\sqrt{5})$

40) $\sqrt{10}(\sqrt{2}+4)$

41) $\sqrt{15}(\sqrt{3}+5\sqrt{5})$

42) $\sqrt{5}(-2\sqrt{5}+3)$

43) $\dfrac{\sqrt{18}}{3\sqrt{15}}$

44) $\dfrac{3-\sqrt{10}}{\sqrt{6}}$

Write each expression in radical form.

45) $8m^{\frac{1}{4}}$

46) $(10r)^{\frac{6}{5}}$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

47) $2x^{\frac{1}{2}}y^{\frac{7}{4}} \cdot 3x^{\frac{1}{2}}y^{\frac{2}{3}}$

48) $y^{-\frac{1}{2}} \cdot 4xy^{-1}$

Simplify each expression.

49) $\dfrac{\dfrac{9}{16}}{\dfrac{9}{u+3}}$

50) $\dfrac{\dfrac{x-1}{4}}{\dfrac{x^2}{16}}$

51) $\dfrac{\dfrac{16}{3m}}{\dfrac{4}{3}}$

52) $\dfrac{\dfrac{1}{4}}{\dfrac{a+4}{16}}$

53) $\dfrac{\dfrac{1}{4}+\dfrac{3}{4x}}{x^2}$

54) $\dfrac{\dfrac{1}{4}-\dfrac{16}{a^2}}{a}$

55) $\dfrac{\dfrac{4}{a}}{\dfrac{1}{2}+\dfrac{a^2}{4}}$

56) $\dfrac{\dfrac{a+3}{a}-\dfrac{a}{a+3}}{25}$

57) $\dfrac{3x^2+37x+70}{9x^2+27x+14}\cdot\dfrac{3x+2}{2x-8}$

58) $\dfrac{4p+16}{3p-4}\div\dfrac{8p-12}{6p^2-17p+12}$

59) $\dfrac{21k-7}{6k^3-2k^2}\cdot\dfrac{18k-18}{3k-3}$

60) $\dfrac{3n^2-n-30}{5n^2+29n-6}\div\dfrac{3n^2+17n-90}{5n-1}$

61) $\dfrac{6}{a-6}-\dfrac{4a}{a-2}$

62) $\dfrac{2}{3x-1}+\dfrac{6x}{x+4}$

Solve each equation. Remember to check for extraneous solutions.

63) $\dfrac{2}{k^2}=\dfrac{1}{k^2}-\dfrac{1}{k}$

64) $\dfrac{1}{2}=\dfrac{1}{6}+\dfrac{p-6}{6p}$

65) $\dfrac{x}{6x^2-2x-20}=\dfrac{1}{2x-4}+\dfrac{1}{6x^2-2x-20}$

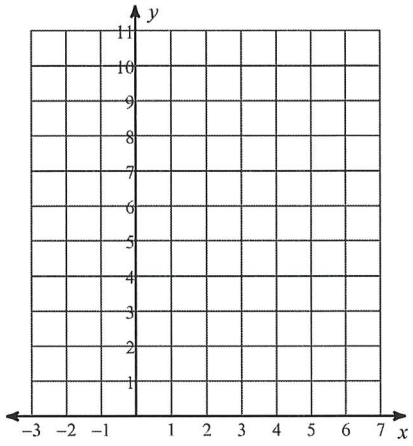
66) $\dfrac{1}{2}=\dfrac{1}{2k-4}-\dfrac{k+4}{2k-4}$

67) $\frac{3}{n} + \frac{3}{n^2 - 5n} = \frac{1}{n^2 - 5n}$

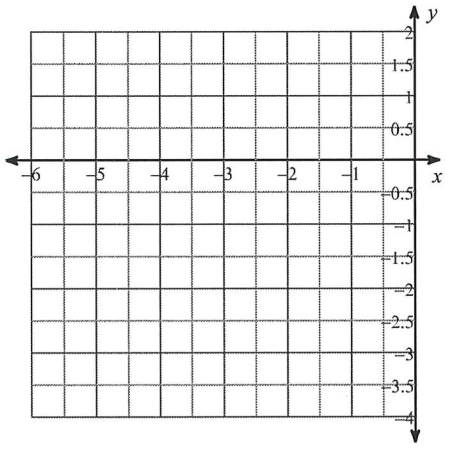
68) $\frac{2}{p^2 + 2p} = \frac{1}{p} + \frac{1}{p^2 + 2p}$

Find the vertex and sketch the graph of each function.

69) $y = 2x^2 - 8x + 10$



70) $y = -(x + 2)^2 + 1$



71) A rectangle has a perimeter of 76 inches. The length of the rectangle is 6 more than 3 times the width. Find the dimensions of the rectangle.

72) The area of a rectangular room is 696 square feet. The perimeter of the room is 106 feet. Write and solve a system of equations to find the dimensions of the room.

73) The length of a rectangle is 8 feet more that twice the width. Write the area of the rectangle in terms of the width, w.

74) The height of a cylinder is 2 inches less than four times the radius. Write the volume of the cylinder in terms of the radius, r. (Leave in terms of π as well.)

75) The height of a rectangular prism is 4 inches more than twice the width. The length of the rectangluar prism is 10 inches more than four times the width. Write a function for the volume of the rectangular prism in terms of the width, w. Your answer should be standard form.