Math Summer Enrichment Packet for Calculus Honors

Purpose: The purpose of our summer math enrichment program is to ensure that the skills, knowledge, and content mastered over the course of the year are retained over the summer. This will help students to be better prepared and ready to succeed in their next math course.

Grading: Completion of all the assigned pages/problems will be counted as your first test/project grade of the year. You will be graded upon completion of all the work.

Where do I complete the assignments?

All problems should be completed on lined paper. Neatness is important in math, so take your time and use a pencil. Show all of your work and clearly number all of the problems. Circle your answers.

Due Date: The assignment will be due to your teacher on the first day of class.

What if I struggle with the work?

Parents/guardians and students, please be aware that the math packet does not come with additional examples and/or instructions. Sections of this packet may be challenging for you at times. We suggest that if you run into difficulty with certain concepts and/or problems that you seek out advice from family and friends, previous math tutors, or utilize resources such as Khan Academy. The key is to give the assignment your best effort.

Have a great summer! We look forward to working with all of you next year.

Best wishes, Your Math Department 1. Use the graph of g(x) to answer the following questions.



Perform the indicated operations.

2)
$$(2x^2 - 6x + 11) - (-3x^2 + 7x - 2)$$

3) $-6(2y^2 + 4y - 3) + 4(-y^3 + 6y - 3)$
4) $(3z - 2y)(3z + 5y)$
5) $(\frac{2}{5}y + \frac{1}{4}x)(\frac{3}{2}y + \frac{1}{2}x)$
6) $(2m + 1)(4m^2 - 2m + 1)$
7) $(2a - 4b)^2$

Factor each polynomial completely. Remember to check for GCF, special products, and factoring by grouping.

8) $7a^3 + 14a^2$	9) 60m ⁴ – 120m ³ n+50m ² n ²
10) $x^2 + 9x + 20$	11) a² – 6ab +5ab²
12) $3x^2 + 10x + 7$	13) 9x² - 64
14) 3x ² - 3x - 18	15) 2x ² – 3x – 2
16) 2xy - x +4y - 2	17) 5x ² – 13x +6
18) 4x ² -100	19) x ⁴ – 1
20) 3x ⁵ – 75x ³	21) 25x ² +70x -49

Simplify each rational expression. (Try factoring the numerator and denominator)

22)
$$\frac{4x^2 - 8x^2}{4x^2}$$
 23) $\frac{m^2 - 4m + 4}{m^2 + m - 6}$

24)
$$\frac{2k-16}{6} + \frac{4k-32}{3}$$
 25) $\frac{8}{3a-1} + \frac{2}{a-1}$

Solve each equation.

26) 2[3m - 2(3 - m) - 4] = 6m - 4
27)
$$\frac{2}{3}$$
k - k + $\frac{3}{8} = \frac{1}{2}$

- 28) $m^2 = 14m 49$ 29) $49w^2 = 25$
- 30) $(y-6)^2 = 81$ 31) $9x^2 48x = -64$

32)
$$\frac{2n}{n-5} + \frac{4n-30}{n-5}$$
 33) $\frac{2m}{m-2} - \frac{6}{m} = \frac{12}{m^2 - 2m}$

Simplify each expression

- 34) $\sqrt[3]{8r^6s^3t^9}$ 35) $-3\sqrt{5} + \sqrt{20}$
- 36) $\sqrt{6} \cdot \sqrt{2}$ 37) $(-7 + \sqrt{3x})(4 + \sqrt{3x})$

38)
$$(\sqrt{-4} - 7)(\sqrt{-2} + 6)$$
 39) $\frac{\sqrt{7+1}}{\sqrt{7-1}}$

Find the asymptotes and homes in the graph of each function, if any.

40)
$$f(x) = \frac{x^2 - 4}{x + 4}$$
 41) $g(x) = \sqrt{2x - 4}$

42) y =
$$\frac{1}{x+3}$$
 43) h(x) = $\frac{2}{x} - 4$

Use
$$f(x) = \frac{5x}{x^2 - 9}$$
 and $g(x) = \frac{7}{x - 3}$ to find the following.
44) $f(-3)$
45) $f(2x)$
46) $g(3)$
47) $f(x) \div g(x)$
48) $g(f(x))$
49) $f(x) + g(x)$

50) f(g(x))