Geometry Honors Summer Packet
The Woodlands College Park High School

Honors Mathematics courses are designed for those students who show high levels of aptitude for, interest in, and/or commitment to the study of Mathematics. The courses will cover and extend the state required curriculum in both content and depth. Each course is aligned with the College Board's recommendations and prepares students to be successful in college level courses. As you consider academic and extra-curricular commitments for the next school year, it is imperative to consider the following before enrolling in a Honors Mathematics course:

- The pace of Honors courses is faster than that of the academic level Mathematics courses.
- It will be assumed that students in Honors Math courses have mastered the material from previous
- Math courses. In general, review of concepts that were developed in the prior Mathematics courses will be minimal.
- Daily attendance and daily review of class notes are crucial for a thorough understanding of the concepts.
- Students should expect an average of 30 to 60 minutes of work outside of class each day.
- Assessments are rigorous and 70% of the course grade is determined by test grades.
- All tests must be completed within a single class period.
- In general, there are not many extra credit opportunities. Grades are based almost solely on mastery of the material.

The following criteria correlate highly with success in Honors Mathematics courses:
- Near-perfect attendance. Catching up in a Honors Math class can be very difficult.
- Exceptionally high rates of accuracy and timely completion on daily assignments.
- High grades (85 and above) in current Honors Math class.
- Strong ability to work independently.
- Strong organizational and time management skills.

Students are expected to have mastered the concepts from Algebra 1 prior to the beginning of class. These concepts include, but are not limited to:
- Solving equations
- Order of operations
- Solving systems of linear equations
- Writing equations of lines
- Graphing linear functions (including parallel and perpendicular lines)
- Graphing quadratic functions
- Factor and solve quadratic equations
- Working with fractions (proper and improper)

The attached summer packet covers the topics listed above and is designed to ensure your readiness to enter Honors Geometry next year. When calculators are used, we will be using the TI-84 graphing calculator in this class. It is suggested that you purchase this to have at home for homework assignments.

This packet is entirely voluntary, and students will not be penalized for not doing it. However, it is highly suggested that students complete it over the summer so that they are ready for Geometry Honors.

Solving Equations

1. Solve for x. $\quad -\frac{3}{4}(-8x + 12) + 4 = \frac{1}{2}(-20x - 10)$

2. Solve for x: $\quad \frac{8x}{3} = 120$

3. Solve for x_2: $\quad P = \frac{x_1 + x_2}{4b} \cdot m$

4. Solve for l: $\quad \frac{1}{2}Pl = S$

5. Given $y = \frac{1}{3}(4 - x)^2$, what is the value of $x = -16$?

Simplifying Polynomials

6. Simplify the following: $2q^2 - \frac{5}{3}(3q - 2) + 9q^2$

7. Simplify the following: $\frac{1}{2}g^2 + \frac{7}{2} + 3g^2 - \frac{4}{5}g + \frac{1}{4}$

8. Simplify the following: $\frac{1}{3}g^2 + \frac{7}{3} - \left(2g^2 - \frac{2}{5}g + \frac{1}{2}\right)$

9. Simplify the following: $(9x + 1)^2$

Solving Systems

10. What is the solution to this linear system of equations?
$$2x = 4y$$
$$-4x + 4 = -4y$$

11. A group of students go out to dinner. If 4 have pizza and 8 have pasta, the bill will be $72. If 8 have pizza and 4 have pasta, the bill will be $48. Solve the system of linear equations to determine the price of the pasta.

12. Molly and Stefan are selling cookie dough for a school fundraiser. Customers can buy packages of sugar cookie dough and packages of gingerbread cookie dough. Molly sold 7 packages of sugar cookie dough and 1 package of gingerbread cookie dough for a total of $75. Stefan sold 14 packages of sugar cookie dough and 12 packages of gingerbread cookie dough for a total of $270. Write a system of equations to find the cost of each type of cookie.

13. Solve the system. $\begin{cases} y = 2x - 4 \\ y - 2x = 15 \end{cases}$

14. Solve the system. $\begin{cases} 3x + 6y = 15 \\ 2x + 5y = 12 \end{cases}$

15. Solve. $\begin{cases} 5x + 9y + 5y - 35 = 180 \\ 5y - 35 = 45 - 2x \end{cases}$

16. Solve. $\begin{cases} 36 = x + y \\ 3y + 24 = 9x \end{cases}$

<u>Linear Functions</u>

17. Find the slope of the line between the two points: $(6, 11)$ $(-4, -1)$

18. Write the equation of the line in point-slope form given the information below:
$$slope = \frac{1}{2}, going\ through\ (2, -4)$$

19. Write the equation of the line with the given information.
$$m = undefined,\ going\ through\ (0, 0)$$

20. Write the equation of the line that is *parallel* to the given equation and going through the given coordinate. $3x + y = 10, (2, -1)$

21. Write the equation of the line (in slope intercept form) that is *perpendicular* to the given equation and going through the given coordinate.
$$y = -4x + 6, (-8, 5)$$

22. What is the slope of the line in the $xy - plane$ that passes through the points $\left(-\frac{5}{2}, 1\right)$ and $\left(-\frac{1}{2}, 4\right)$?
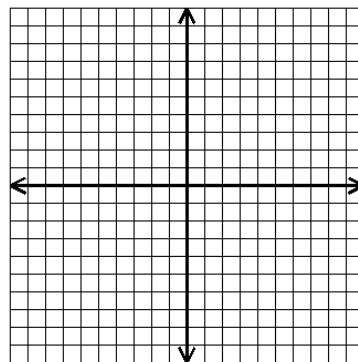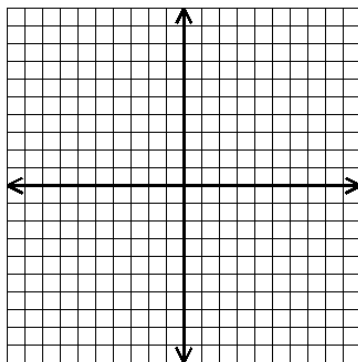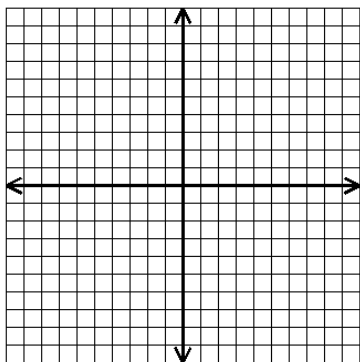
23. What is the equation of the line that passes through the point (-2,7) and has a slope of zero?

Graph the following:

24. $y - 3 = \frac{3}{2}(x + 2)$ 27. $x = 3$ 28. $y = -5$
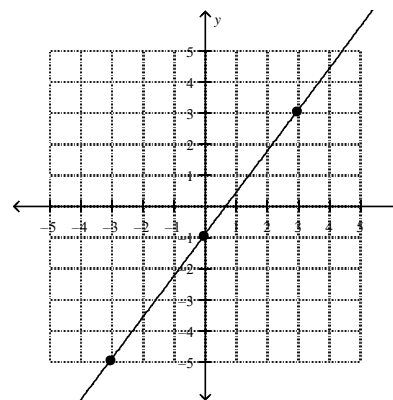
Write the equation of the line in all three forms for the graph to the right.

29. Slope-intercept form.

30. Point-slope form.

31. Standard form.

Quadratic Functions

32. Using the quadratic formula, find the solutions: $-2x^2 = -7x - 4$ Keep answer in exact form.

25. Factor the following: $10x^2 - 11x = 6$

26. Solve the quadratic function: $x^2 - 2x - 3 = 0$

27. Solve using the quadratic formula: $4x^2 - 20x = -25$ Leave answer in exact form.

28. Factor the trinomial: $x^2 - 12x + 35$

29. Solve by completing the square: $x^2 + 4x = 32$

30. Solve by completing the square: $x^2 - 6x - 22$ Keep answer in exact form.

31. Solve: $2x^2 + 3x + 4x - 5 = 10$

32. Solve: $x^2 + -9x = 70$

33. Solve: $\frac{x^2 + 2x^2 + 7x}{2} = 6x + 1$

34. Solve: $x^2 + (x + 7)^2 = (x + 9)^2$

Simplifying Radicals

Simplify. Keep answers in simplified radical form.

35. $\sqrt{98}$

36. $8\sqrt{3} \times 6\sqrt{3}$

37. $3\sqrt{45} + 7\sqrt{36}$

38. $-3\sqrt{72} + 6\sqrt{52} - 7\sqrt{128}$

39. $\left(4\sqrt{2}\right)^2 + 8\sqrt{2}$

40. $\sqrt{\frac{20}{6}}$

41. $10\sqrt{6} \times \frac{20\sqrt{6}}{\sqrt{3}}$

42. Solve for g: $3g - 3 = \frac{18}{\sqrt{3}}$

43. Solve for h: $h\sqrt{2} = \frac{9}{\sqrt{3}}$