

Name: _____

Honors Geometry Summer Packet

Welcome to the Honors Geometry class at Union High School. The Honors program is designed to help advanced students develop their reasoning and problem-solving skills. The class is both challenging and rewarding. You will need to apply your Algebra skills to solve geometric problems. This packet is designed to help keep your Algebra skills sharp over the summer recess.

Print this packet and answer each of the questions in the space provided. **Show your work** or you will not receive credit. You may use any public resources such as books and web sites to complete the assignment. This assignment will be collected on the second day of school and graded as a quiz.

Enjoy the summer.

1. Solve: $8y - (2y - 3) = 9$

2. Solve: $\frac{2}{3}x + \frac{x}{2} = 7$

3. Solve: $0.2n + 9 = 8(0.4n - 1)$

4. A sloth travels at a rate of 0.5 meters per minute.
- Write a rule to describe the function relating distance travelled to time.
 - How far will the sloth travel in 8 minutes?

5. A line passes through $(-7, 1)$ and $(4,4)$. Write the equation of the line in slope-intercept form.

6. Find the third, sixth, and eighth terms of the sequence $A(n) = 5 + (n - 1)(-2)$.

7. Write an equation to model the data.

x	y
0	1
1	2
2	4
3	8
4	16

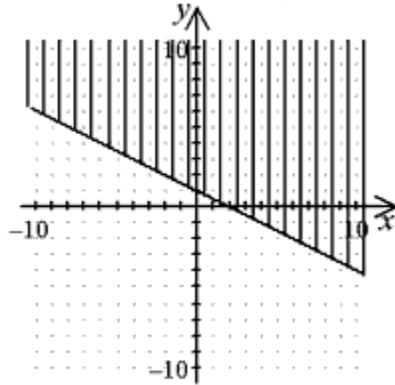
8. Write $2 \cdot 10^{-3}$ as a decimal.

9. Write an equation for the translation of $y = |x|$ down 0.75 units.

10. Juan drives to work. Due to traffic, he averages 22 miles per hour. He returns home averaging 32 miles per hour. The total travel time is 2.25 hours. Write and solve an equation to find the time Juan spends driving to work. (Hint: $d=r \cdot t$. Make a table) No guess and check.

11. How many different arrangements can be made with the letters in the word POWER?

12. Write a linear inequality for the following graph.

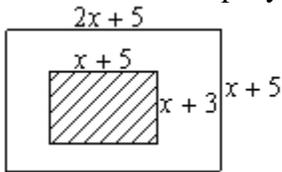


13. Divide and simplify: $\frac{(x^2 - 36)}{(x - 4)} \div \frac{(x + 6)}{1}$

14. Simplify -2^4 .

15. Two travelers are 220 kilometers apart at noon and are headed toward each other along a straight road. They meet at 5:30 P.M., and one traveled 20 kilometers per hour faster than the other. What is the speed of the faster traveler?

16. Write and simplify an algebraic expression that represents the area of the *unshaded* region.



17. Find the velocity of an object after it has fallen 88 feet. Use $v = \sqrt{2gh}$ where v is the velocity, g is the acceleration due to gravity (approximately 32 feet per second squared) and h is the distance the object has fallen.

18. The art teachers at a school planned to take 300 students on a field trip to an art museum. One teacher found that 6 of her 36 students could identify a painting by Picasso before the field trip. Based on P (students identifying Picasso painting) from the teacher's class, predict how many of the 300 students would be able to identify a painting by Picasso before the field trip.

19. Solve the compound inequality and graph the solution: $-1 \leq -x - 2 < 1$

20. Solve $\frac{12}{x} + \frac{24}{x-1} = 11$. Check your solution.

21. Simplify $(4 + \sqrt{5})^2$.

22. Solve $x^2 - 2x - 2 = 0$. If necessary, round to the nearest hundredth.

23. Find the number of x-intercepts of the related function of $6 = 3x^2 + 2x$.

24. Write an equation for the line that is parallel to $y = -5x + 5$ and passes through $(-6, 3)$.

25. Simplify $(4jk^4)^3(jk)^4$.

26. What reason would you give for Step 2 in the solution of the following equation?

Step 1: $-\frac{g}{2} + 5 = -7$

Step 2: $-\frac{g}{2} + 5 - 5 = -7 - 5$

27. Solve the system of equations.

$$3m + 4n = -10$$

$$m = -1 + n$$

28. Solve: $x^2 - 16x + 55 = 0$.

29. Simplify $\frac{8a^9}{125a^6}$

30. On Tuesday, the closing price of an ABC company share was \$38.50. It had risen \$4.08 from the previous day. Find the closing price of an ABC stock on Monday.

31. Simplify $\sqrt{\frac{21}{3}}$

32. Simplify $\sqrt{24} \cdot \sqrt{2x} \cdot \sqrt{3x}$

33. Simplify $\sqrt{\frac{3}{7x}}$.

34. Simplify $(3x - 6y^2)^2$.

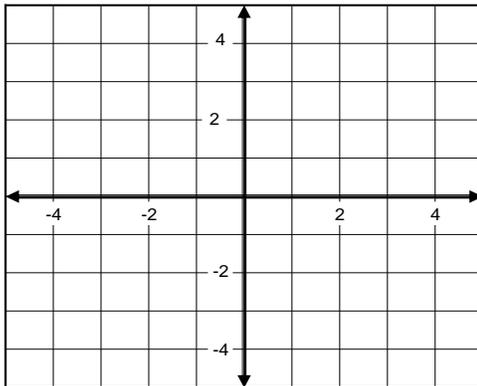
35. There are 1170 students in a school. The ratio of girls to boys is 23:22. Write a system of equations to model this problem. Solve the system.

36. Factor $x^8 + x^3$.

37. Write $y = \frac{-4x}{5} + 7$ in standard form ($ax + by = c$) using integers.

38. Suppose you invest \$10,400 in equipment to manufacture a new board game. Each game costs \$2.65 to manufacture and sells for \$20. How many games must you sell to break even?

39. Graph $y = 2x^2 + 4x$.



40. Mrs. Huang operates a soybean farm outside Grinnell, Iowa. To keep her operating costs down, she buys many products in bulk and transfers them to smaller containers for use on the farm. Often the bulk products are not the correct concentration and need to be custom mixed before Mrs. Huang can use them. One day she wants to apply herbicide to a large field. A solution of 67% herbicide is to be mixed with a solution of 46% herbicide to form 42 liters of a 55% solution. How much of the 67% solution must she use?