

Name _____

Argo Community High School

Honors Algebra 2

Summer Packet

It is essential that the incoming Honors Algebra 2 students are exceptional in basic Algebraic concepts. The problems in this packet are designed to help you review topics from previous Mathematics courses that are crucial to your success in Honors Algebra 2.

You should be able to complete most, if not all, of these problems without a calculator!!

Please show all work that leads you to each solution. You may use your notes from previous Mathematics courses, or you may search information via the internet to get help with these topics. *If you have any additional questions, please feel free to e-mail us at any time throughout the summer.*

If an additional copy of this packet is needed, you may obtain it from Argo's Mathematics website. This packet will count as part of your first semester grade so all work should be completed and turned in on the first day of school. ***If the packet is not complete, you will receive a 0 on the assignment.*** We will have a TEST covering this material during the 1st week of school. Have a wonderful summer! We are looking forward to seeing you this fall!!

Sincerely,

Howard Sirota

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Honors Algebra II Instructor

Topic: Algebraic Expressions

Use the order of operations to evaluate each expression. Show all of your work!!

1. $-8 + 5(1 - (-3))^3 + 4 \cdot 6$

2. $5^2 - 6(2 - (-1))^4$

3. $14 + (13 - 6)^2 - 6 \cdot 4$

4. $\frac{7 \cdot (9 - 3)^2}{12}$

5. Evaluate $-4x^2 + 6x - 5$ when $x = -3$.

6. Evaluate $2x^3 + 3x^2 + 27$ when $x = -4$.

7. Evaluate $6|4b - 5| - 3|2 - 2b|$ when $b = -2$.

Simplify:

8. $4x^2 - 12 + \frac{2}{3}x - \frac{8}{5}x^2 - 3x$

9. $3(2x - 4) - 4(x - 5)$

10. $\left(c^3 + \frac{c^2}{6} - 4\right) - \left(c^4 - \frac{c^3}{2} + \frac{c^2}{4} + c\right)$

Topic: Solving Equations

Solve each equation. You must show all of your work. Make sure to check your solutions!

11. $2x - 3 = -7$

12. $11 = \frac{-2}{3}x + 1$

13. $1.5r + 9 = 4.5$

14. $6y - 4 = 2y + 10$

15. $2(f + 2) = -5(f - 8)$

16. $3(m - 2) - 5 = 8 - 2(m - 4)$

17. Solve for h : $S = 2\pi r^2 + 2\pi rh$

18. Solve for b_2 : $A = \frac{1}{2}h(b_1 + b_2)$

19. Solve for x : $cx - b = ax + d$

20. Solve for y : $5x - 3y = 9$

In problems #21 through 24, make sure to write and solve an equation (with variables) to answer the application problems.

21. The sides of a rectangle are in the ratio of 3:2. Write and solve an equation to find the length of each side if the perimeter of the rectangle is 55 cm?
22. The measure of the supplement of an angle is 20° more than three times the measure of the original angle. Write and solve an equation to find the measure of the angles.
23. Michael drove to a friend's house at a rate of 40 mph. He returned by the same route at a rate of 45 mph. The driving time for the round trip was 4 hours. Write and solve an equation to find the distance that Michael traveled.
24. Write and solve an equation to find 4 consecutive odd integers with a sum of 184.

Topic: Solving Inequalities

Solve and graph each inequality. You must show all of your work.

25. $11 < -3x - 13$

26. $7x + 9 \geq 10x - 12$



27. $\frac{2}{5}(10k - 5) \leq -k$



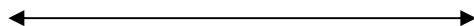
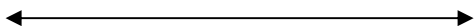
28. $10 - (y - 6) > 9$



29. $-8 \leq 3x + 4 \leq 22$



30. $-7 < 5(x - 6) + 11 \leq 4$



31. $3x - 5 \leq -11$ or $2x - 3 > 3$

32. $3(x - 4) < 3$ or $\frac{3}{4}x \geq \frac{2}{3}$



Topic: Relations & Functions

33. Determine whether the relation is a function? Determine the domain and range for each.

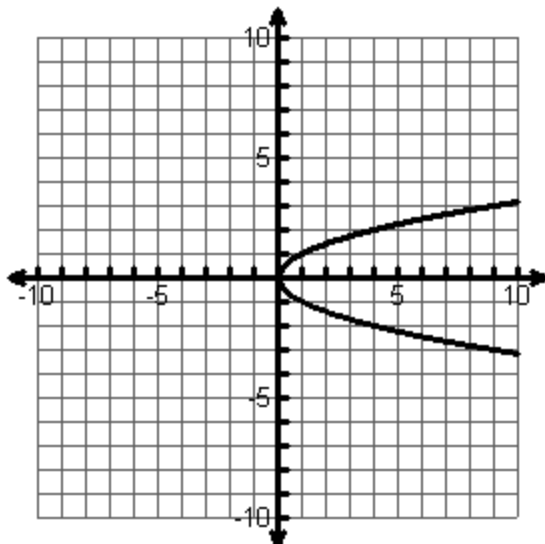
a. $\{(10,100), (20,250), (30,400), (40,400)\}$

b. $\{(5,15), (10,20), (15,18), (10,13)\}$

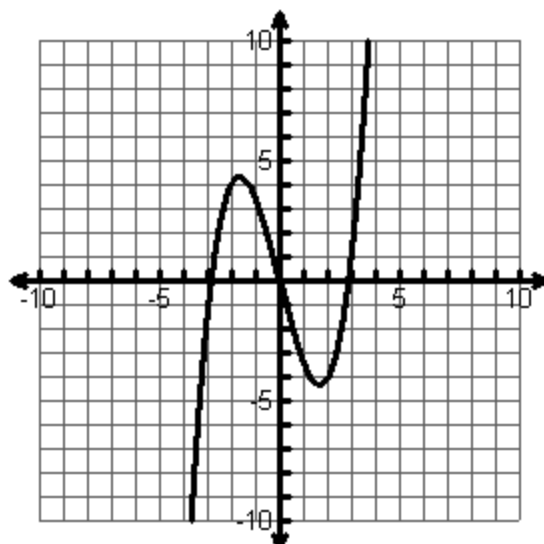
c. $\{(3,9), (4,-2), (5,-3), (6,-2), (7,-9)\}$

34. Do the graphs below represent functions? Justify your answer in complete sentences.

a.



b.



35. Is the relation $y = -7x - 3$ a function? Justify your answer.

36. Evaluate $f(x) = -3x + 7$ when $x = -4$.

37. Evaluate $g(x) = -4x^2 - 3x - 7$ when $x = -5$.

38. Let $h(x) = -\frac{1}{3}x + 2$. Find $-4h(9)$.

Topic: Linear Equations

39. Calculate the slope of the line passing through $(-2, -4)$ and $(3, -1)$.

40. Calculate the slope of the line passing through $(1, -5)$ and $(-2, 3)$.

41. Calculate the slope of the line passing through $(8, 4)$ and $(8, -1)$.

42. Write an equation of the line which goes thru $(-3, 4)$ and has a slope of $\frac{2}{3}$.

43. Write an equation of the line which goes thru $(1, 5)$ and $(4, 2)$.

44. Write an equation of the line which goes thru $(-4, 12)$ and $(-1, 2)$.

45. Write an equation of the line which goes thru $(2, -3)$ and is perpendicular to the line $-2x + y = -17$.

46. Write an equation of the line which goes thru $(-4, 11)$ and is parallel to the line $y = \frac{3}{4}x - 22$.

47. What are the intercepts of the function $-6x + 4y = -48$?

48. A 2-mile cab ride costs \$5.25. A 5-mile cab ride costs \$10.50.

a. Write an equation to model the cost of the cab ride, y , as a function of distance, x .

b. According to your equation, how much should a 3.8-mile cab ride cost?

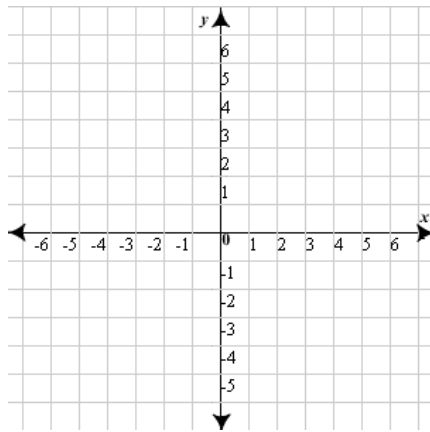
49. A new promotion was introduced at the Daily Southtown at the end of last year. After 5 months of the new promotion, there were 5730 subscribers to the newspaper. After 7 months of the promotion, the number of subscribers increased to 6022.

a. Write an equation to model the number of subscribers, y , as a function of the time, x , following the promotion.

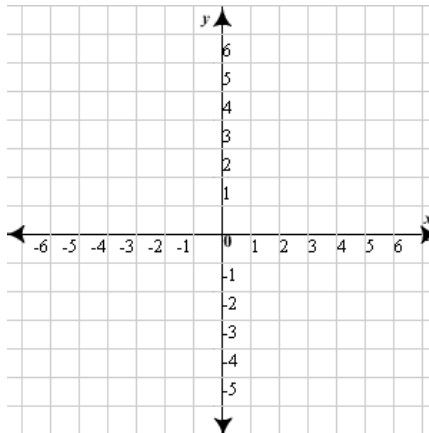
b. According to your equation, how many subscribers will there be after 10 months?

Use the graph paper provided to graph the following functions.

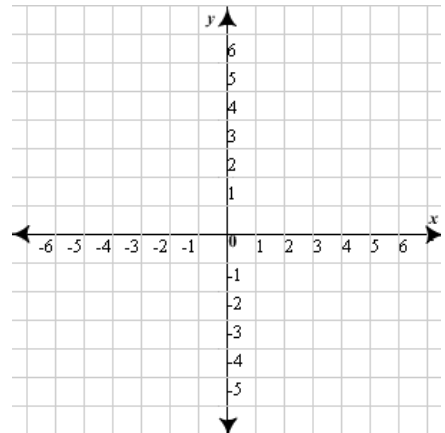
50. $y = x - 6$



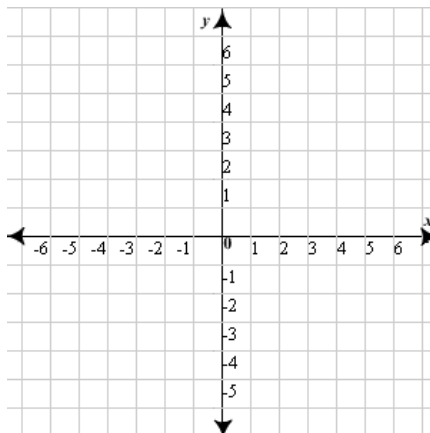
51. $y = -\frac{2}{3}x + 4$



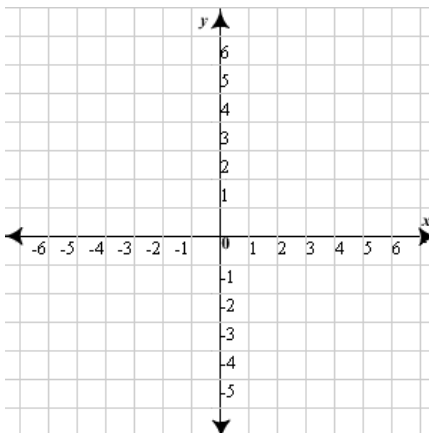
52. $2x + 5y = -10$



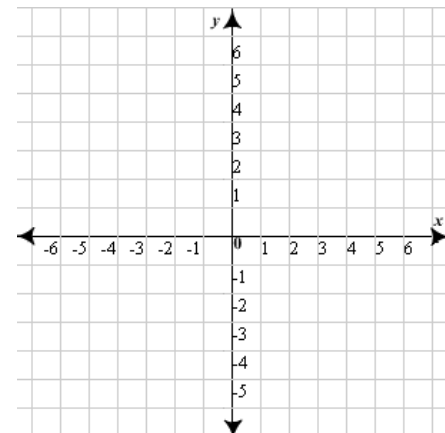
53. $4x - 2y = -16$



54. $x = -3$



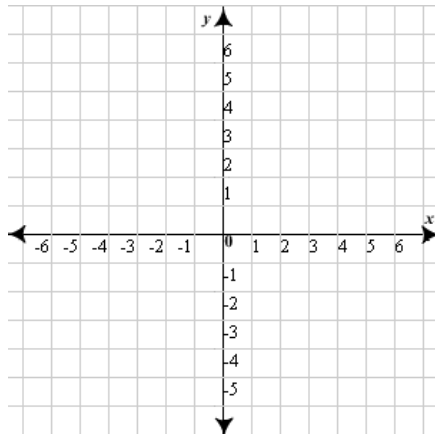
55. $y = 2$



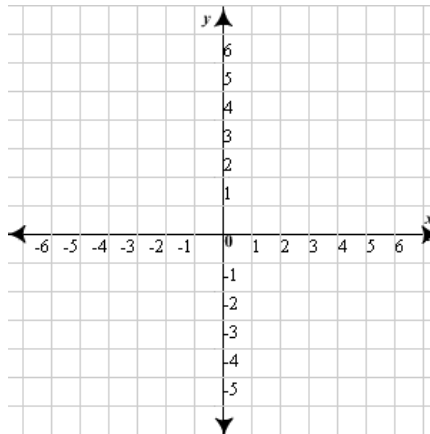
Topic: Two-Variable Inequalities

Use the graph paper provided to graph the following functions.

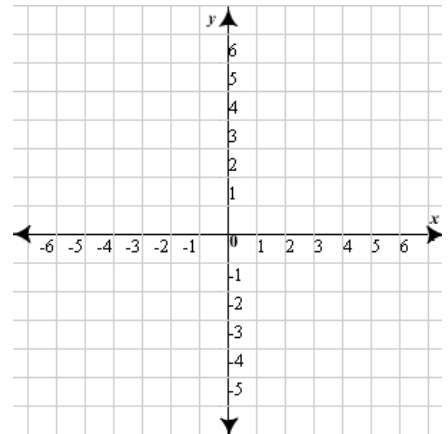
56. $y > 2x - 4$



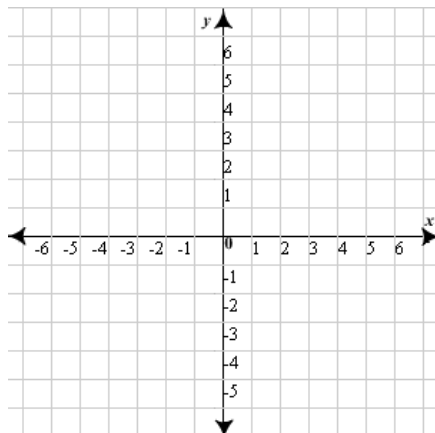
57. $y \leq 3 - \frac{1}{2}x$



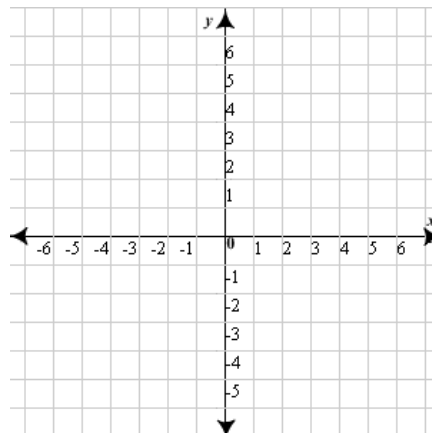
58. $6x - 9y < -36$



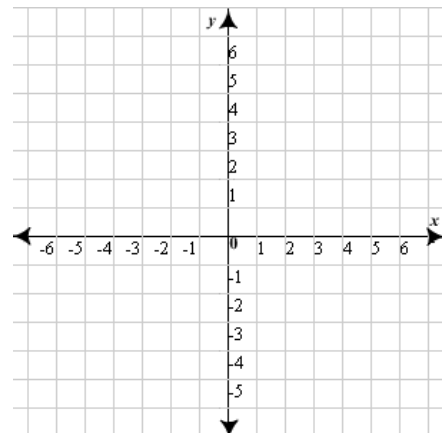
59. $2y - 3x \geq 10$



60. $x < -5$



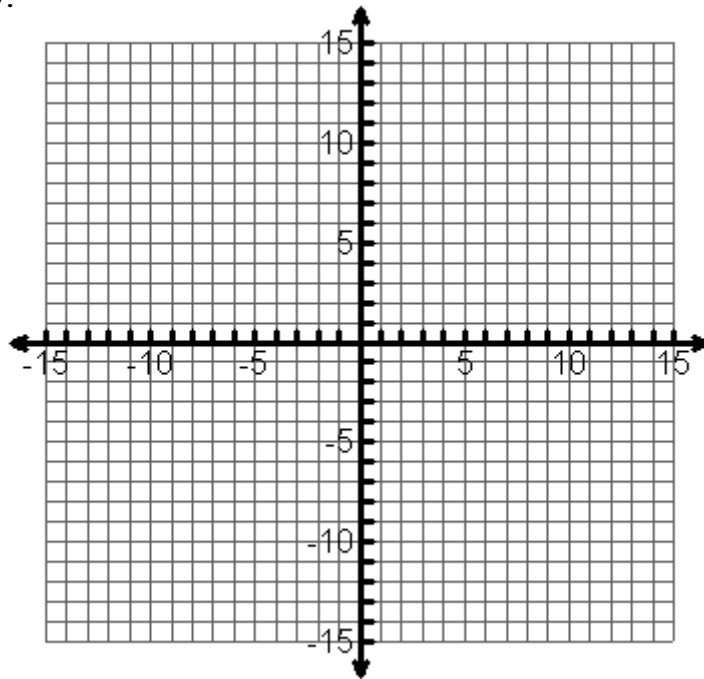
61. $y > 2$



62. Sara has \$150 to spend on CD's and DVD's. CD's cost \$10 apiece, while DVD's cost \$15 apiece.

- a. Write a linear inequality to represent the number of CD's, x , and the number of DVD's, y , that Sara can buy.

- b. Graph the inequality.



- b. Give 2 possible solutions.