Perth Amboy High School

This summer packet is designed to maintain and strengthen your algebra skills. The problems in this summer assignment contain prerequisite skills and concepts from Algebra 1. These are necessary skills for success in Algebra 2 Honors.

Use a pencil and **SHOW ALL WORK**. Work must be legible, well organized and solutions clearly labeled. You should show and/or explain how you arrived at all answers. Please do not wait until the last day of vacation to get started.

This assignment is due the first day of school. If you are unsure how to solve any of the problems, it will be to your advantage to review online. Suggested websites are:

http://www.coolmath.com/algebra
http://patrickjmt.com/
https://www.khanacademy.org/math/algebra2

Have a great summer and we look forward to meeting you in the fall.

Solving Linear Equations

1. Solve for x: $11(x-5) = 2(x+6) - 13$	2. Solve for b: $\dfrac{2b-3}{7} - \dfrac{b}{2} = \dfrac{b+3}{14}$

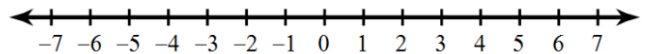| 3. Solve for m: $2 - 5\lvert 5m - 5\rvert = -73$	4. Solve for h: $A = 2\pi r^2 + 2\pi r h$

Solving Linear Inequalities

Directions: Solve the inequality for x. Graph the solution set.
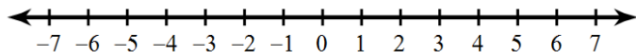
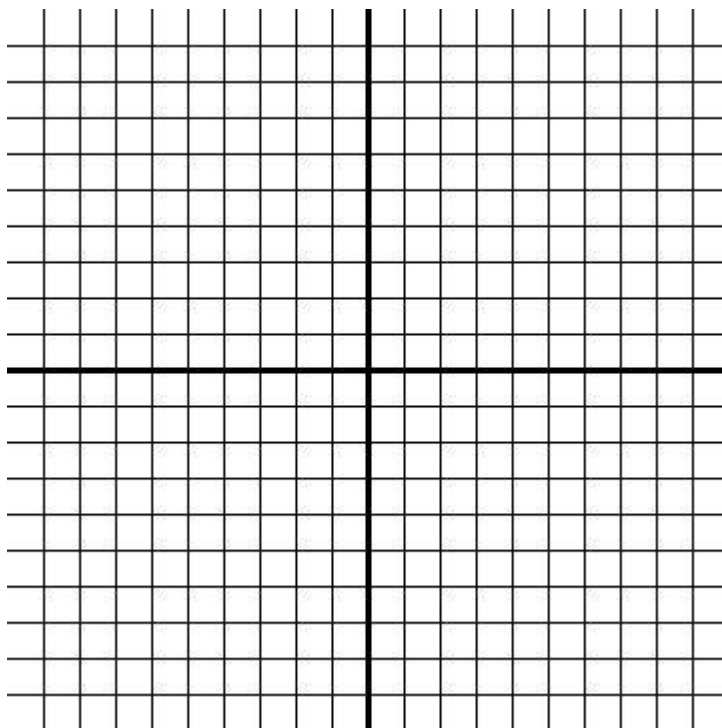| 5. $-2(5 + x) < -22$	6. $2x + 9 \le 3$ or $10 - 5x < 0$

Graphing Linear Equations

Graph each linear equation. State the x-and y-intercepts of each linear equation.

7. $3x - 5y - 10 = 0$
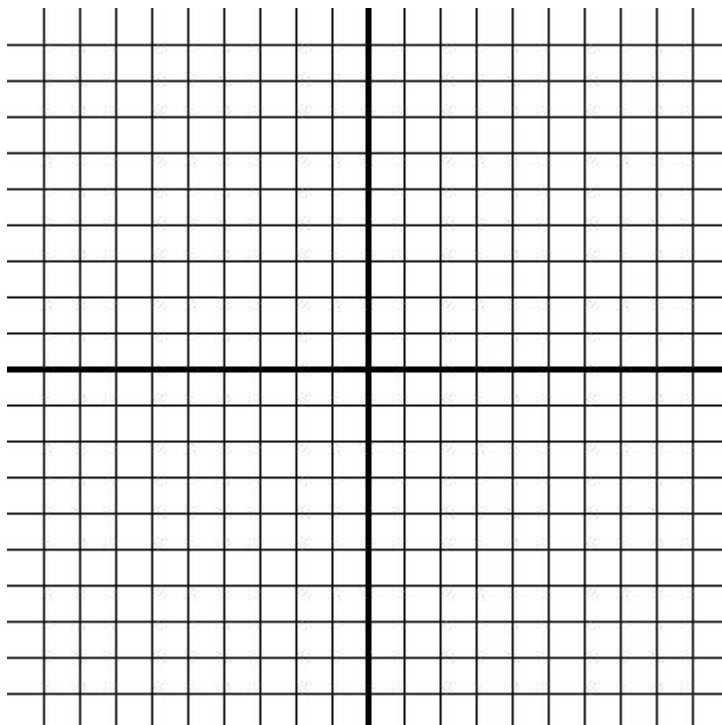
x-intercept:_____

y-intercept: _____

Slope: _____

8. $2x - 8 = 3(x - 2)$

x-intercept:_____

y-intercept: _____

Slope: _____

Writing Equations of Lines

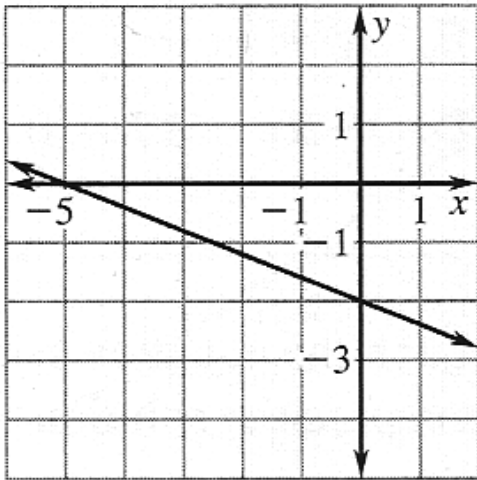| |
|---|
| **Slope-Intercept Form**: $y = mx + b$ **Standard Form**: $Ax + By = C$
 Point-Slope Form: $y - y_1 = m(x - x_1)$ **slope** $= m = \dfrac{y_2 - y_1}{x_2 - x_1}$ |

Write the equation of the line using the given information.

9. What is the equation, in slope-intercept form, of the line shown?.

10. Write an equation of the line that passes through the given points: (–5, 9) and (–2, 7). Write your equation in all three forms:

   a. slope-intercept form

   b. point-slope form

   c. standard form

11. Write the equation, in slope-intercept form, of the line which passes through (4, 2) and is parallel to the line $y - 2x = -4$.
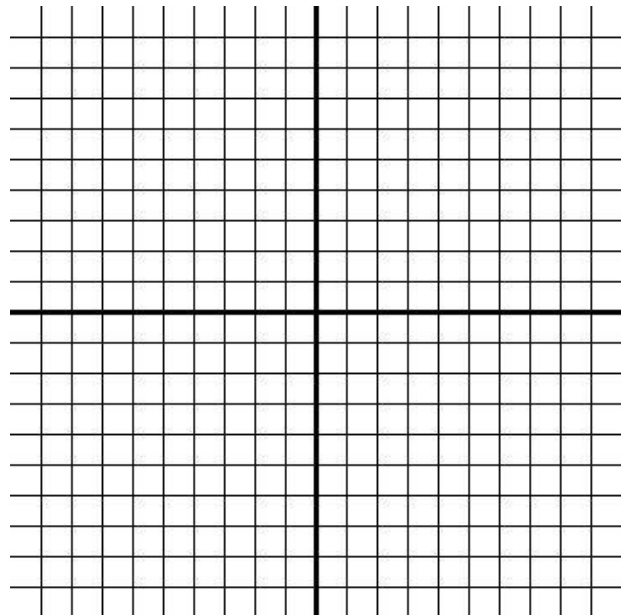
Solving Linear Systems

Solve the following systems of equations using the best method of either the substitution method or the elimination method

12. Solve : $\begin{cases} 2x + y = 23 \\ 3x + 2y = 37 \end{cases}$	13. Graph the linear system and state the solution. $\begin{cases} y = -\dfrac{3}{2}x + 4 \\ 2y - 3x = -4 \end{cases}$

14. The PAHS band boosters are organizing a trip to a national competition for the 226-member marching band. A bus will hold 70 students and their instruments. A van will hold 8 students and their instruments. A bus costs $280 to rent for the trip. A van costs $70 to rent for the trip. The boosters have $980 to use for transportation.

a. Define your variables.

b. Write a system of linear equations whose solution is how many buses and vans should be rented.

c. Solve the system by whichever method you choose. Write a sentence to describe the solution.

Polynomial Expressions

Simplify each expression.

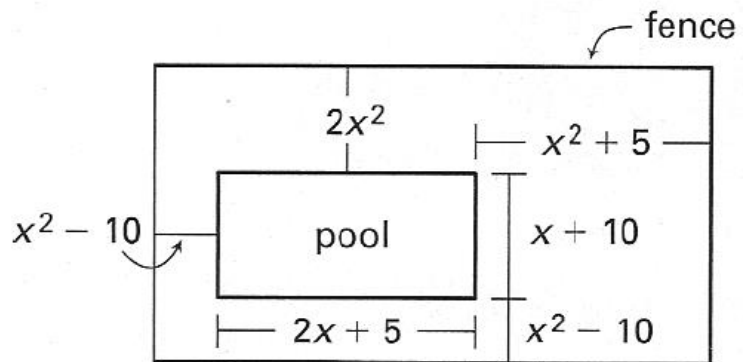|	
15. $\dfrac{(x^2y)^3}{2xy^2} * \left(\dfrac{3x^4y2}{2xy}\right)^{-2}$	16. $(2x - 1)(x + 4)(x - 2)$
17. $4(2x^2 - 7x - 5) - 2(3x^2 + 11x - 4)$	18. $(7x - 2)(x^2 + 3x - 5)$

19. You want to fence in a pool and deck area. Find the expression which correctly determines the amount of fencing required to complete the job.

   Circle the best answer choice.

   a. $5x^2 + 3x$

   b. $10x^2 + 6x$

   c. $10x^2 + 3x + 10$

   d. $5x^2 + 6x + 10$

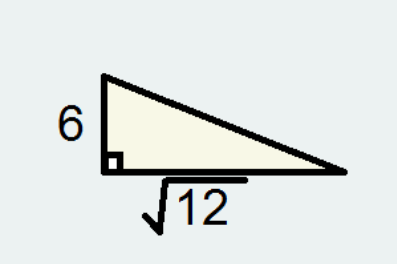   e. $10x^2 + 8x + 20$

Factoring Quadratics

Factor each expression completely.

19. $49x^2 - 25$	20. $4x^2 + 4x - 24$
21. $6x^2 - x - 5$	22. $8x^3 + 20x^2 - 18x - 45$
23. If $x^2 - 13x + 42 = (x + A)(x + B)$, then find the value of $3A - B$.	

Simplifying Radical Expressions

Simplify each radical expression. Leave all answers in simplest radical form.

24. $4\sqrt{80} + \sqrt{28} - 5\sqrt{45}$	25. $\dfrac{6}{4 - 2\sqrt{5}}$
26. Find the perimeter of the following triangle:	

Solving Quadratic Equations

Solve each of the following quadratic equations.

27. $4x^2 + 8x = -3$	28. $y^3 + 6y^2 = 27y$

29. A boy standing on the top of a building in Perth Amboy throws a water balloon up vertically. The height, **h** (in feet), of the water balloon is given by the equation

$$h(t) = -16t^2 + 64t + 192$$

where t is the time (in seconds) after he threw the water billon. What is the value of **t** when the balloon hits the ground. Show how you arrived at your answer.

Reading Information from Graphs

30. Identify each of the following for $f(x)$ shown to the right.

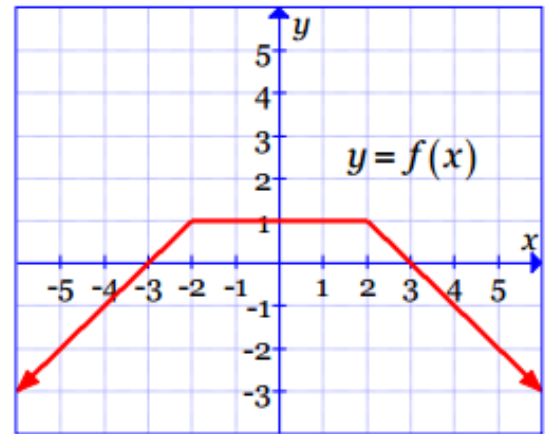a. Domain of $f(x)$ _____

b. Range of $f(x)$ _____

c. The zeros of $f(x)$ _____

d. The value of $f(0)$ _____

e. The values of x for which $f(x) > 0$ _____

f. The values of x for which $f(x) = -2$ _____

g. Is $f(4)$ positive or negative? _____ Why? _____

Graphing Quadratic Equations

31. Graph: $f(x) = x^2 - 2x - 8$

Identify each of the following:

a. Axis of symmetry: _____

b. Vertex: _____

c. y- intercept: _____

d. x-intercepts(s): _____

e. Domain: _____

f. Range: _____