

# Discrete Mathematics Summer Assignment



Welcome to **Discrete Mathematics**! This review assignment is designed to refresh your Algebra skills. It includes information that was taught in previous courses and will be used throughout the upcoming school year. As you prepare, you may need to seek help by accessing the suggested resources or links provided.

# IMPORTANT: Read this page first...

## INSTRUCTIONS:

1. Complete all sections and problems in this packet on your own.
2. Make sure to show your work to earn credit
3. Calculators: try to complete without the assistance of a calculator

## GRADING:

- On the first day of school, your math teacher will check for full completion of this Summer Assignment and the supporting work for your responses (no work = no credit). This part will be weighted at 50% - this is the grade that represents your effort and following of directions.
- Your teacher will then review the assignment and provide remediation as needed.
- Upon completion of your teacher's review, you will be given an assessment (a "test") based on the topics covered in this assignment. This assessment will be weighted at 50% - this is the grade that represents your mastery of the skills.
- The two weighted scores combined will count as one Project grade for the 1<sup>st</sup> trimester.
- Acceptance of late assignments will be limited and subject to point deductions.

**We are looking forward to meeting you in September. Go Bulldogs!**

## RESOURCES & REFERENCE MATERIALS:

<https://www.freemathhelp.com/>

<https://www.mathplanet.com/>

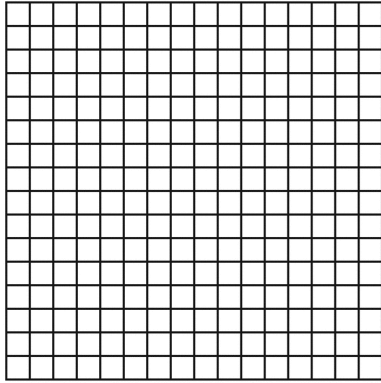
<https://www.mathway.com/Algebra>

A. **Graph the following: YOU NEED TO PUT IN THE X-AXIS AND THE Y-A-XIS!**

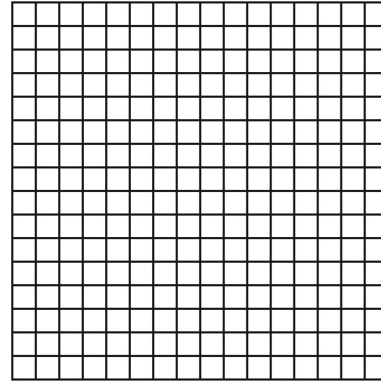


**Keywords:** Graphing lines; Graphing quadratic equations; Graphing inequalities

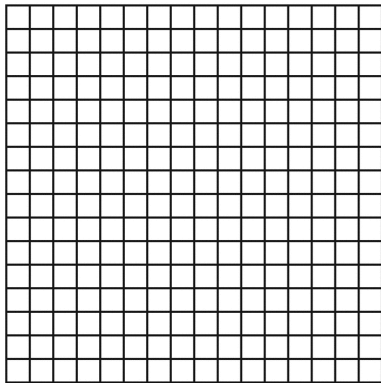
1.  $3x + 4y = 12$



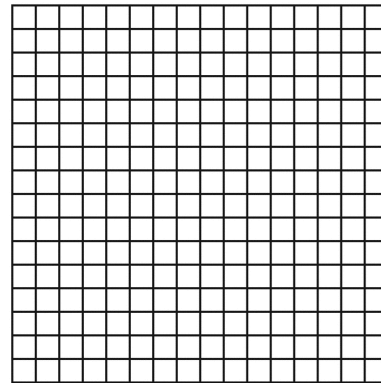
2.  $x = -2$  and  $y = 4$



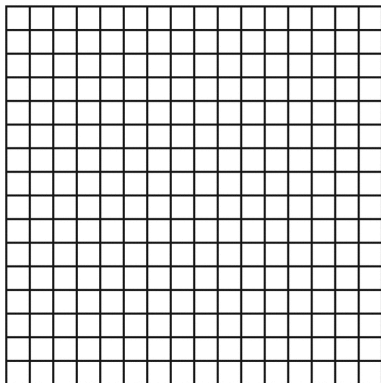
3.  $6x + 12y \leq -24$



4.  $-4x + 2y = 10$

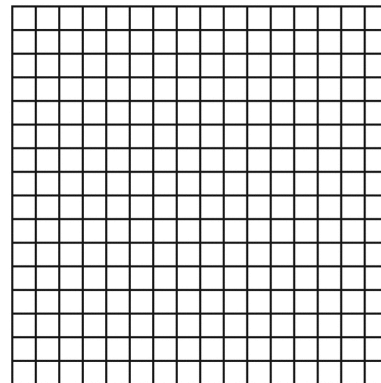


5.  $6 < 3x + 3y$



$2x - y = 6$   
 $6. x + 2y = -2$

What is the point where the two lines intersect ?



B. 7. Are the following lines parallel, perpendicular or neither? Explain your answer.



**Key words:** Writing linear equations; parallel and perpendicular lines

$$2x - 4y = 16 \quad \text{and} \quad 6x + 3y = -4$$

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C. 8. Find the distance and midpoint between the two points.



**Key words:** Distance and midpoint formulas

$$(-4, -2) \text{ and } (1, -5)$$

Distance: \_\_\_\_\_

Midpoint: \_\_\_\_\_

D. Simplify the following using the laws of exponents.



**Key words:** Simplifying exponent expressions; Laws of exponents

9. \_\_\_\_\_  $(6x^3y^4)^{-2}$

10. \_\_\_\_\_  $\frac{4x^4y^7}{8x^5y^3}$

11. \_\_\_\_\_  $\frac{3c^3d^4}{5}$

12. \_\_\_\_\_  $\frac{12x^{-3}y^{-5}}{3x^{-6}y^4}$

13. \_\_\_\_\_  $5^5 \cdot 5^0 \cdot 5^{-3}$

14. \_\_\_\_\_  $\frac{x^{10}}{3y^4} \cdot \frac{9x^2y^2}{x^4y^3}$

E. Simplify the following polynomial expressions.



**Key words:** Simplifying polynomials; adding, subtracting, multiplying polynomials

15. \_\_\_\_\_  $(2x^2 + 6x + 3) + (3x^2 + 4x - 4)$

16. \_\_\_\_\_  $(6x^3 - 7x^4 + 10x) - (4x^3 - 6x^2 + 2x - 3)$

17. \_\_\_\_\_  $(2x + 7)(x - 5)$

18. \_\_\_\_\_  $(2x - 3)^2$

19. \_\_\_\_\_  $(3x - 2)^3$

20. \_\_\_\_\_  $(4x + 3)(x^2 - 2x + 5)$

21. \_\_\_\_\_  $(5x - 3)(x + 1)(x + 6)$

F. Simplify the following rational expressions.



**Keywords:** Simplifying rational expressions; add, subtract, multiply and divide rational expressions

28. \_\_\_\_\_  $\frac{x^3 + 3x^2}{2x} \cdot \frac{5x^3}{x^2 + 5x + 6}$

29. \_\_\_\_\_  $\frac{x^2 + 2x - 35}{x^2 - 7x + 12} \div \frac{x^2 - 13x + 40}{3x^2 - 12x}$

30. \_\_\_\_\_  $\frac{4}{3x} + \frac{2}{5x}$

31. \_\_\_\_\_  $\frac{2x+1}{x^2-4} + \frac{5}{x-2}$

32. \_\_\_\_\_  $\frac{8x-1}{x^2+x-6} - \frac{4}{x-2}$

G. Solve the following equations and inequalities.



**Keywords:** Solving: equations, rational equations, quadratic equations

33. \_\_\_\_\_  $\frac{7}{x} + \frac{1}{2} = 4$

34. \_\_\_\_\_  $\frac{1}{2x} + \frac{x}{3} = 7$

35. \_\_\_\_\_  $2x^2 - 5x = 7$

36. \_\_\_\_\_  $3y^2 + 2y = 5 - 4y$

37. \_\_\_\_\_  $-4(x+2)^2 = -20$

38. \_\_\_\_\_  $-5(2x-1) = 3(x+4)$



39. \_\_\_\_\_  $-6 \leq 3x + 2 \leq 11$

**Key words:** *Solving inequalities*

I. **Problem Solving:**



**Keywords:** *Solving linear and quadratic word problems*

40. You pay \$38.50 for a sweater that is marked 30% off the regular price. What is the regular price of the sweater? How much did you save by buying it on sale?

41. A candy factory needs a box that has a volume of 30 cubic inches. The width should be 2 inches less than the height and the length should be 5 inches greater than the height. What should the dimensions of the box be?

42. Last year the volleyball team bought pairs socks for \$5 per pair and shorts for \$17 per pair. They spent \$315. This year socks are \$6 per pair and shorts are \$18 per pair. The same number of socks and shirts now cost \$342. Use a system of two equations to determine how many pairs of each item were purchased?

43. The sum of two numbers is 12. The difference of the same two numbers is -4. Find the two numbers.