Pre-algebra skills needed for Algebra I

- Use the order of operations to simplify expression.
- Fluently work with all four operations and fractions (math 7 skill)
- Convert units
- Solve multiple step equations using inverse operations
- Evaluate expressions (substitution with positive and negative numbers)
- Solving Linear equations/inequalities which require the use of distributive property, combining like terms, simplification and completing calculations involving fractions and decimals.
- Graph and name points on the coordinate plane.
- Given a two variable function,
  - Create a table of values and graph the equation
  - Get the equation in y=mx+b form so you can quickly graph.
  - Be able to write the equation of a line from a graph
- Given two points,
  - Be able to find the slope of a line that connects them,
  - Be able to write the equation of a line goes through both points.
- Given an equation of a line,
  - Write the equation of a line parallel to the given line
  - Write the equation of a line perpendicular to the given line
- Multiplying monomials

PRACTICE PROBLEMS

Using the order of operations to simplify expressions

1. $54 \div 3 - 3 \times 2 = 18 - 6 = 12$

2. $8 \div 2(4) - 4^2 = 8 \div 2(4) - 16 = 4(4) - 16 = 16 - 16 = 0$

3. $2(4-7)^2 - 4 \div 2 = 2(-3)^2 - 2 = 2 \cdot 9 - 2 = 16$

4. $-3^2 - 7 \div 2 + 5 = -9 - 3.5 + 5 = -7.5$

5. $(-7) - (-8) \div 2^2 + 5 = -7 + 8 \div 4 + 5 = -7 + 2 + 5 = 0$

6. $(-3)^3 - 4 \div 2(2) - 10 = -27 - 2 \cdot 2 - 10 = -27 - 4 - 10 = -41$

7. $7 - 4(3-8) - (-2+9) = 7 - 4(-5) - (7) = 7 + 20 - 7 = 20$

8. $8 \div 4(2) - (6-9)^2 = 2(2) - (-3)^2 = 4 - 9 = -5$

Working with all four operations and fractions (math 7 skill)

9. $\frac{3}{5}+\frac{2}{3}\times\frac{3}{5}=\frac{3}{5}+\frac{2}{5}=\frac{5}{5}=1$

10. $\frac{3}{5}+\frac{2}{3}\div\frac{3}{5}=\frac{3}{5}+\frac{2}{3}\times\frac{5}{3}=\frac{3}{5}+\frac{10}{9}=\frac{27+50}{45}=\frac{77}{45}$

11. $\frac{1}{3}+\frac{1}{4}-\frac{1}{6}=\frac{4}{12}+\frac{3}{12}-\frac{2}{12}=\frac{5}{12}$

12. $\frac{1}{3}\times 4-\frac{1}{6}=\frac{4}{3}-\frac{1}{6}=\frac{8}{6}-\frac{1}{6}=\frac{7}{6}$

13. $2\frac{1}{3}+1\frac{1}{4}-3\frac{1}{6}=2\frac{4}{12}+1\frac{3}{12}-3\frac{2}{12}=\frac{5}{12}$

14. $(-\frac{1}{3})^{2}\div\frac{1}{3}=\frac{1}{9}\div\frac{1}{3}=\frac{1}{9}\cdot\frac{3}{1}=\frac{3}{9}=\frac{1}{3}$

Converting units.

15. 16 ft = __5__ yd __1__ ft

16. 108 in = __9___ ft __-___ in

17. 16 in =__1___ ft __4___ in

18. 86 in = __7___ ft __2___ in

19. 1.5 hr = ___90_____ min

20. 72 min = __1___ hr __12__ min

21. 90 min = __1.5__ hr

22. 2.5 hr = ___2___ hr __30__ min

Solve multiple step equations using inverse operations

23. $3x + 8x = -11$
$11x = -11$
$x = -1$

24. $-4x - 9 = 13$
$-4x = 22$
$x = -\frac{22}{4} or -\frac{11}{2}$

25. $-7t - 6t = 0$
$-13t = 0$
$t = 0$

26. $-y + 3 + 8y = 17$
$3 + 7y = 17$
$7y = 14$
$y = 2$

27. $b - (5 - 3b) = 19$
$b - 5 + 3b = 19$
$4b - 5 = 19$
$4b = 24$
$b = 6$

28. $2(t + 3) = 3(7 - t)$
$2t + 6 = 21 - 3t$
$5t = 15$
$t = 3$

29. $4 - \frac{2}{3}t = 5$
$-\frac{2}{3}t = 1$
$t = -\frac{3}{2}$

30. $h - \frac{2}{3}h = 6$
$\frac{1}{3}h = 6$
$h = 18$

Evaluate the expressions for x = 2 , y = – 3

31. $3x + 8y = 3(2) + 8(-3) = 6 - 24 = -18$

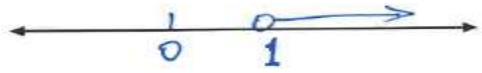
32. $x^2 - y = 2^2 - (-3) = 4 + 3 = 7$

33. $-x^2 + y = -(2)^2 + (-3) = -4 - 3 = -7$

34. $5 + x - y^2 = 5 + 2 - (-3)^2 = 5 + 2 - 9 = -2$

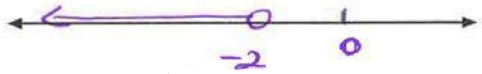
Solving linear inequalities

35. $6x + 2 > 8$
$6x > 6$
$x > 1$

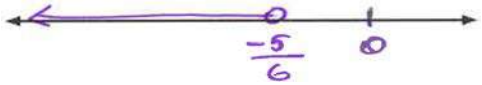


36. $-4x + 3 \leq -9$
$-4x \leq -12$
$x \geq 3$

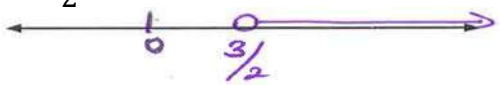
37. $5(x + 2) < 0$
$5x + 10 < 0$
$5x < -10$
$x < -2$



38. $2(x + 1) < \frac{1}{3}$
$2x + 2 < \frac{1}{3}$
$2x < -\frac{5}{3}$
$x < -\frac{5}{6}$



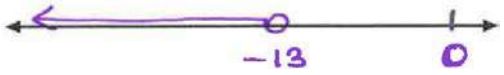
39. $\frac{2}{3}(3 - x) < 1$
$2(3 - x) < 3$
$6 - 2x < 3$
$-2x < -3$
$x > \frac{3}{2}$



40. $0.2x + 2 < -0.6$

$0.2x < -2.6$

$x < -13$

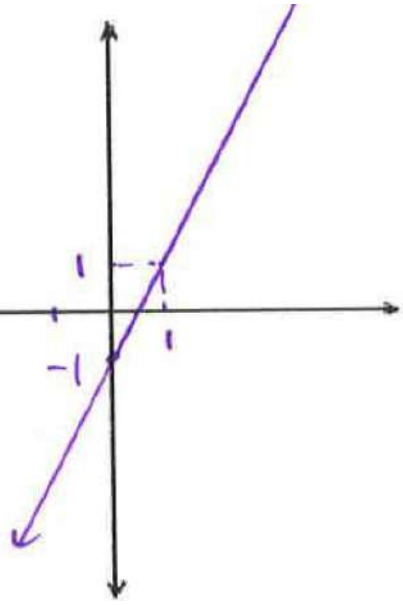


Graphing from tables of values

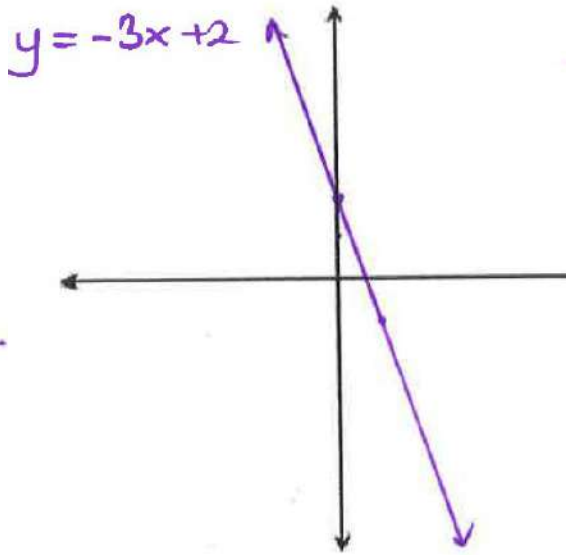
41) *Create a table for each and graph the function*

a) $y = 2x - 1$

x	y
-1	-3
0	-1
1	1



b) $y + 3x = 2$



x	y
-1	5
0	2
1	-1

Writing the equation of a line.

42.) a. Find the slope of a line that crosses through G(-4, 5) and H(-2, -1).

$$m = \frac{5-(-1)}{-4-(-2)} = \frac{6}{-2} = -3$$

b. Write the equation of a line in part (a).

$y = mx + b, G(-4,5)$
$5 = -3(-4) + b$
$5 = 12 + b$
$b = -7$
$y = -3x - 7$

c. Write an equation of a line parallel to the line in part (a).

$y = -3x + any\ number\ other\ than - 7$
Example: $y = -3x + 2$

d. Write an equation of a line perpendicular to the line in part (a).

$y = \frac{1}{3}x + any\ number$
Example: $y = \frac{1}{3}x + 4$

43. Write an equation of a line that crosses through F(5, 7) and M(-3, -1).

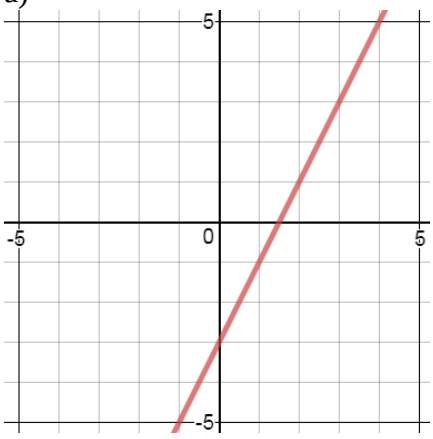
$$m = \frac{7-(-1)}{5-(-3)} = \frac{8}{8} = 1$$

$y = mx + b$
$7 = 1(5) + b$
$b = 2$

$y = 1x + 2$
$y = x + 2$

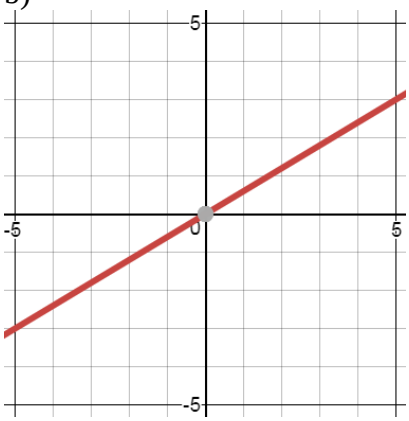
44. Write an equation to the given lines,

a)



Answer: $y = 2x - 3$

b)



Answer: $y = \frac{3}{5}x$

45) Simplify the expressions.

a) $(3x^2)(-4x^3) = -12x^5$

b) $(3x^5)^2 = 9x^{10}$

c) $4x(5x + 4) = 20x^2 + 16x$