

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

$$\begin{aligned}23. \quad 3x + 8x &= -11 \\ 11x &= -11 \\ x &= -1\end{aligned}$$

$$\begin{aligned}24. \quad -4x - 9 &= 13 \\ -4x &= 22 \\ x &= -\frac{22}{4} \text{ or } -\frac{11}{2}\end{aligned}$$

$$\begin{aligned}25. \quad -7t - 6t &= 0 \\ -13t &= 0 \\ t &= 0\end{aligned}$$

$$\begin{aligned}26. \quad -y + 3 + 8y &= 17 \\ 3 + 7y &= 17 \\ 7y &= 14 \\ y &= 2\end{aligned}$$

$$\begin{aligned}27. \quad b - (5 - 3b) &= 19 \\ b - 5 + 3b &= 19 \\ 4b - 5 &= 19 \\ 4b &= 24 \\ b &= 6\end{aligned}$$

$$\begin{aligned}28. \quad 2(t + 3) &= 3(7 - t) \\ 2t + 6 &= 21 - 3t \\ 5t &= 15 \\ t &= 3\end{aligned}$$

$$\begin{aligned}29. \quad 4 - \frac{2}{3}t &= 5 \\ -\frac{2}{3}t &= 1 \\ t &= -\frac{3}{2}\end{aligned}$$

$$\begin{aligned}30. \quad h - \frac{2}{3}h &= 6 \\ \frac{1}{3}h &= 6 \\ h &= 18\end{aligned}$$

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. $-4x + 3 \leq -9$

$-4x \leq -12$

$x \geq 3$

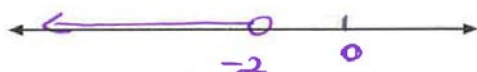


37. $5(x + 2) < 0$

$5x + 10 < 0$

$5x < -10$

$x < -2$



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

$2x + 2 < \frac{1}{3}$

$2x < -\frac{5}{3}$

$x < -\frac{5}{6}$



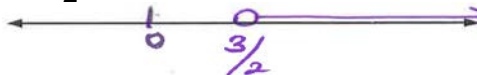
39. $\frac{2}{3}(3 - x) < 1$

$2(3 - x) < 3$

$6 - 2x < 3$

$-2x < -3$

$x > \frac{3}{2}$



40. $0.2x + 2 < -0.6$

$0.2x < -2.6$

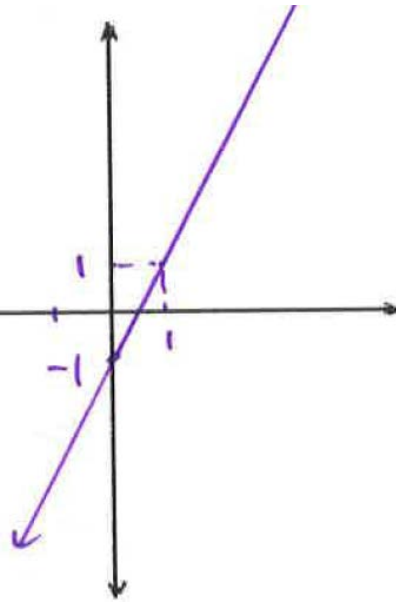
$x < -13$

**Graphing from tables of values**

41) Create a table for each and graph the function

a) $y = 2x - 1$

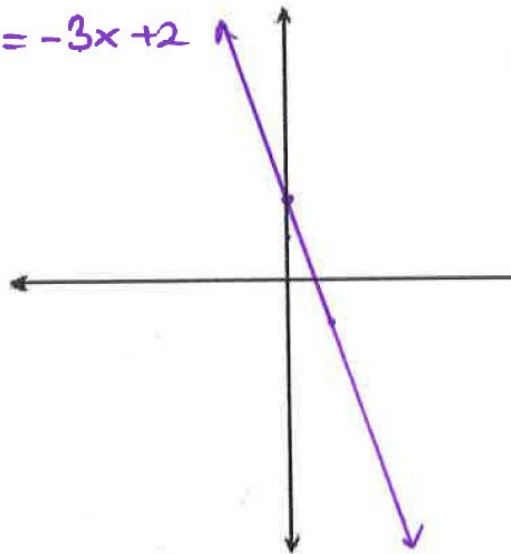
x	y
-1	-3
0	-1
1	1



b) $y + 3x = 2$

$y = -3x + 2$

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).

$$y = -3x + \text{any number other than } -7$$

$$\text{Example: } y = -3x + 2$$

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

$$y = \frac{1}{3}x + \text{any number}$$

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

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

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

$$y = mx + b$$

$$7 = 1(5) + b$$

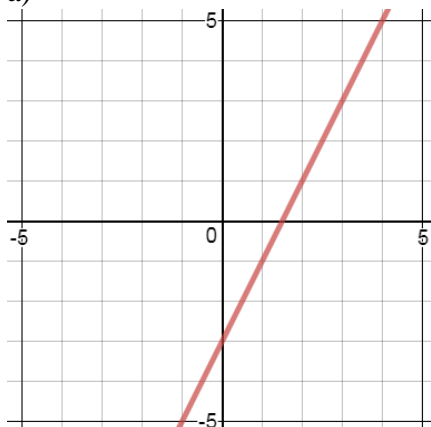
$$b = 2$$

$$y = 1x + 2$$

$$y = x + 2$$

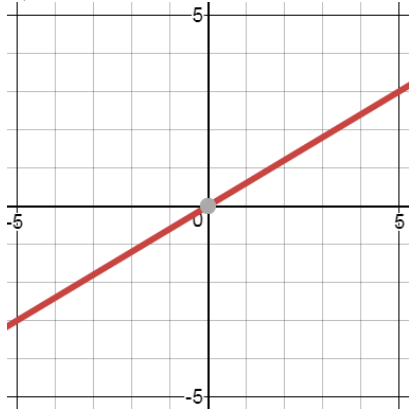
44. Write an equation to the given lines,

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