Prerequisite Skills for Algebra I

Computation:
- o Use order of operations to simplify expressions
- o Simplify fractional expressions
- o Evaluate algebraic expressions (substitution with positive and negative numbers)

Solving Equations and Inequalities:
- o Solve multi-step equations using inverse operations
- o Solve linear equations & inequalities which require the use of distributive property, combining like terms, simplifying and completing calculations involving fractions and decimals

Linear Functions:
- o Graph ordered pairs on the coordinate plane
- o Graph linear functions in slope-intercept form
- o Write the equation of a line from a graph
- o Given two points:
    - o Find the slope of the line that passes through them
    - o Write the equation of the line that passes through them
- o Solve a linear word problem
- o Systems of Equations
    - o Graphing
    - o Substitution method

PRACTICE PROBLEMS

Use order of operations to simplify the following expressions:

1. $54 \div 3 - 3 \times 2$

2. $8 \div 2(4) - 4^2$

3. $2(4 - 7)^2 - 4 \div 2$

4. $-3^2 - 7 \div 2 + 5$

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

6. $(-3)^3 - 4 \div 2(2) - 10$

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

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

Simplify the following fractional expressions:

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

10. $\frac{3}{5} + \frac{2}{3} \div \frac{3}{5}$

11. $\frac{1}{3} + \frac{1}{4} - \frac{1}{6}$

12. $\frac{1}{3} - \left(\frac{1}{4} + \frac{1}{6} \right)$

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

14. $\left(-\frac{1}{3} \right)^2 \div \frac{1}{3}$

Evaluate the following algebraic expressions for x = 2 and y = – 3:

15. $3x + 8y$

16. $x^2 - y$

17. $-x^2 + y$

18. $5 + x - y^2$

Solve the following equations:

19. $3x + 8x = -11$ 20. $-4x - 9 = 13$

21. $-7t - 6t = 0$ 22. $-y + 3 + 8y = 17$

23. $b - (5 - 3b) = 19$ 24. $2(t + 3) = 3(7 - t)$

25. $4 - \frac{2}{3}t = 5$ 26. $h - \frac{2}{3}h = 6$

Solve each of the following linear inequalities. Then graph each solution set on the number line:

27. $6x + 2 > 8$

28. $-4x + 3 \leq -9$

29. $5(x + 2) < 0$

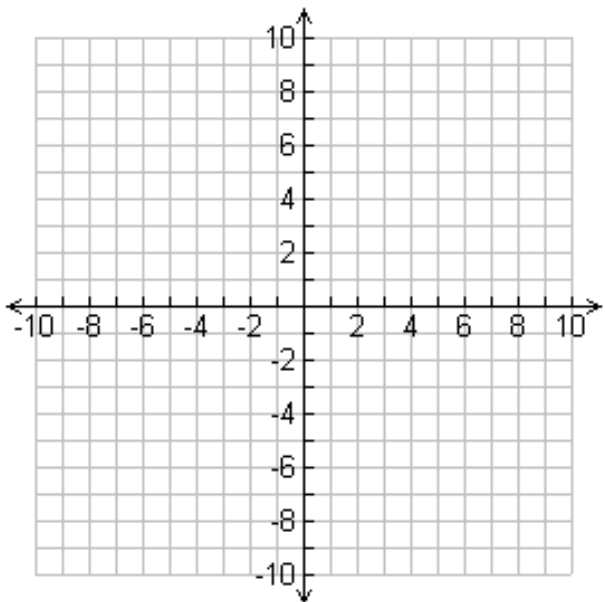30. $2(x + 1) < \frac{1}{3}$

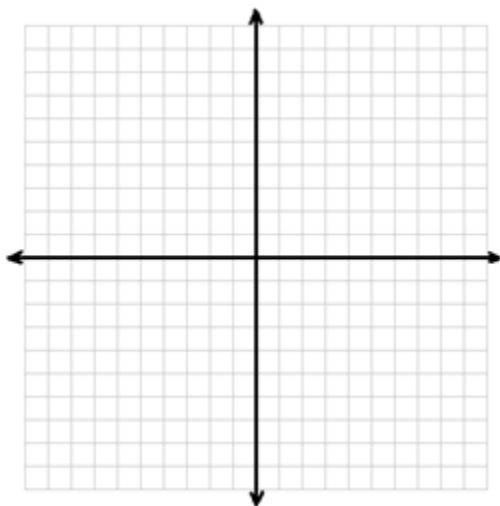31. $\frac{2}{3}(3 - x) < 1$

32. $0.2x + 2 < -0.6$

33. Graph the following ordered pairs on the coordinate plane and label each point:

A: $(3, -2)$ B: $(-10, 10)$ C: $(4, 0)$ D: $(7, 7)$ E: $(-6, 5)$ F: $(0, -8)$ G: $(1, 9)$ H: $\left(\frac{3}{2},\right.$
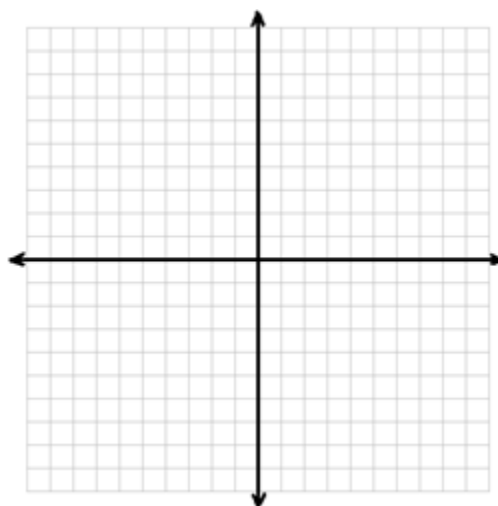

Graph each of the following linear functions:
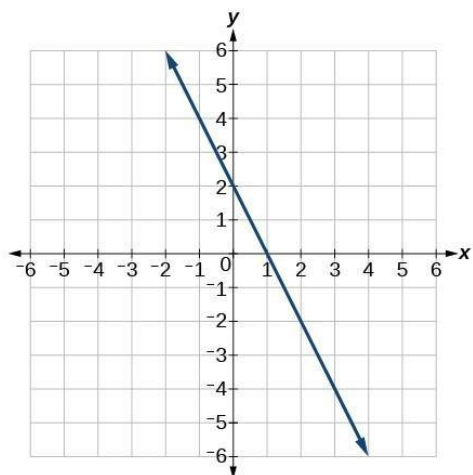
34. $y = \frac{1}{5}x - 7$
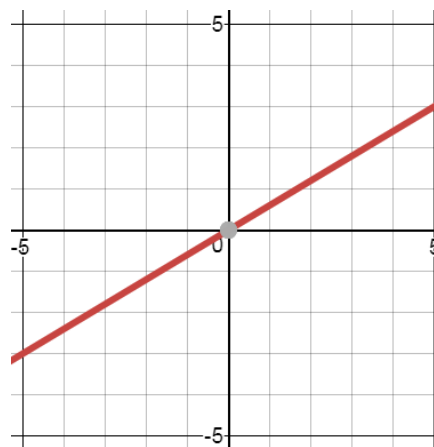

35. $y = -\frac{2}{3}x + 6$

For each of the following graphs, write the equation of the line in slope-intercept form:

36.

37.

Given points G (-4, 5) and H (-2, -1):

    38. Find the slope of the line that passes through them.

    39. Write the equation of the line that passes through them.

Solve the following word problem using a method of your choice:

40. The Robinsons are tearing down their above-ground pool to fix the liner. The pool contains 18,000 gallons of water. The water drains at a rate of 1,500 gallons per hour. How long will it take to empty half of the water out of the pool?