2.4 Solving Linear Inequalities

Solve

a. $-6b+10>40$

b. $8g-12\le 3g+2$

1

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Solve the inequality numerically using the calculator table.

$4x+12<5x+4$

2

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Solve the inequality graphically.

$-x+3\le 4x+13$

3

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2.5 Compound Inequalities

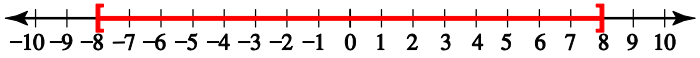
Display the following inequalities on a number line and in interval notation:

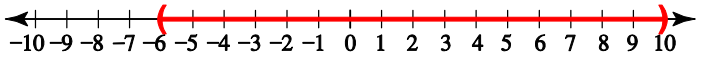
a. $-3\le x<4$

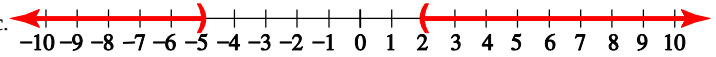
b. $x<1$ *or* $x>5$

4

Write the given interval using a compound inequality.

a. 

b. 

c. 

5

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2.1 Systems of Linear Equations

A System of Linear Equations is a set of two or more equations. The solution to a system is an x and y value that satisfies all the equations in the system. Graphically the solution of a System of Linear Equations is the point where the lines intersect.

Types of systems of equations:

1. **Consistent systems** have at least one solution (intersection point). They have:
   1. Independent lines: Unique lines with different equations that will have only one solution.

   OR

   2. Dependent lines: This system will have infinitely many solutions because the equations and graphs are the same, intersecting itself everywhere.
2. **Inconsistent systems** have no solution and occur when the graphs do not intersect – parallel lines.

Overview of types of systems of linear equations:

Name		Equations	Graphs	Solutions
Consistent system	**Independent lines**	Different equations	Different lines intersecting at one point	The point of intersection: (x,y)
Consistent system	**Dependent lines**	Same equations	Same line intersecting itself everywhere	Infinitely many solutions
Inconsistent system	**Independent lines**	Same slope but different y-intercept	Parallel lines that do not intersect	No solution

Your company wants to print some flyers for advertising a new product. The printer has two options to produce the flyers. The traditional printing cost $250 for setup and $0.15 per page printed. To print the flyers digitally they charge $50 for setup and $0.20 per page printed.

a. Write equations for the cost to print n flyers using these two printing options.

8

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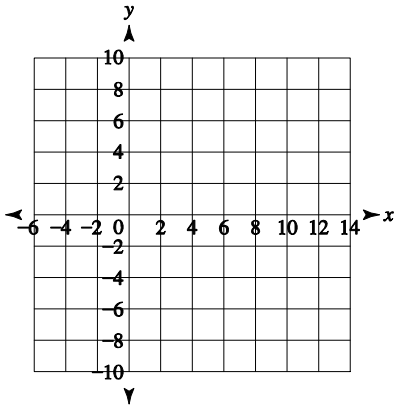
b. Graph the two equations on the same calculator window.

c. Find the number of flyers that will result in the same cost for both printing methods.

Solve the following system by graphing the equations by hand.

$$y = \frac{1}{4}x - 2$$

$$y = -\frac{1}{3}x + 5$$



The percentage of renewable energy produced using geothermal and wind is given in the table. Source: US Statistical Abstract 2009.

Year	Geothermal	Wind
2003	5.37	1.79
2004	5.43	2.24
2005	5.28	2.8
2007	5.12	4.69

a. Find a model (an equation) for the percent of renewable energy produced by using geothermal energy.

The percentage of renewable energy produced using geothermal and wind is given in the table. Source: US Statistical Abstract 2009.

Year	Geothermal	Wind
2003	5.37	1.79
2004	5.43	2.24
2005	5.28	2.8
2007	5.12	4.69

b. Find a model (an equation) for the percent of renewable energy produced by using wind.

The percentage of renewable energy produced using geothermal and wind is given in the table. Source: US Statistical Abstract 2009.

Year	Geothermal	Wind
2003	5.37	1.79
2004	5.43	2.24
2005	5.28	2.8
2007	5.12	4.69

$G(t) = -0.08t + 5.68$

$W(t) = 0.82t - 1.03$

c. Estimate the year in which the percentages of geothermal and wind energy are the same.

For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

a. $y = 6x + 4$

$y = 6x - 2$

b. $y = \frac{2}{5}x - 10$

$y = 0.2x + 1$

For each of the following systems of equations, determine if the system is consistent or inconsistent. If the system is consistent determine if the lines are independent or dependent. Give the solution to the system.

c. $y = \frac{1}{2}x + 6$

$2x - 4y = -24$