Name: _____ Date: _____

Unit 9 Review Packet Algebra 1

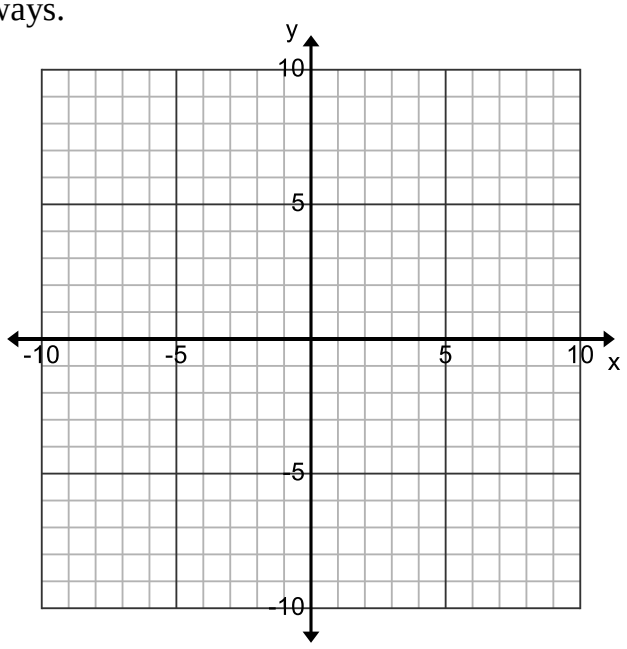
1. **Without solving**, explain why the two linear systems below have the same solution.

$$\begin{cases} 4x + 2y = 26 \\ x + y = 8 \end{cases} \qquad \begin{cases} 4x + 2y = 26 \\ -2x - 2y = -16 \end{cases}$$

2. Solve the following system of linear equations 3 ways.

   a. Graphically

$$\begin{cases} 2x + y = 9 \\ x = 6 - 2y \end{cases}$$



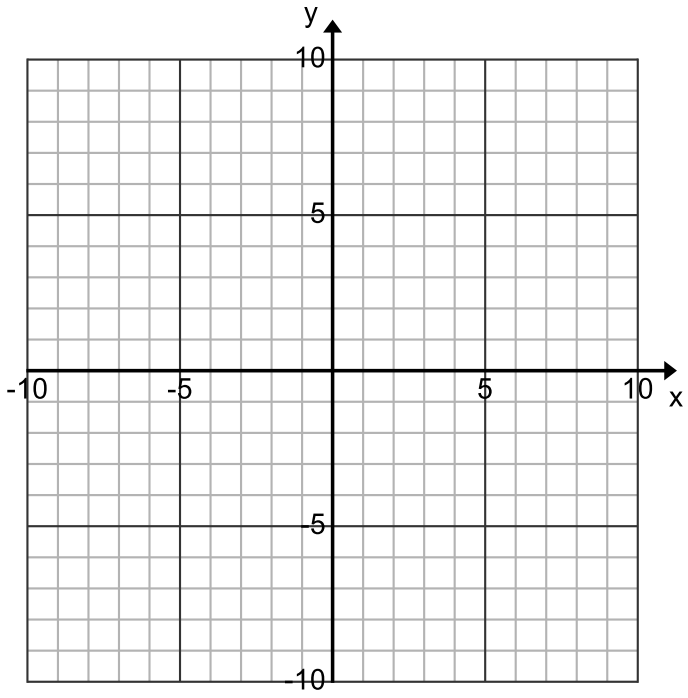
   b. Substitution

$$\begin{cases} 2x + y = 9 \\ x = 6 - 2y \end{cases}$$

   c. Elimination

$$\begin{cases} 2x + y = 9 \\ x = 6 - 2y \end{cases}$$

3. Let $f(x) = x^2 - 3$ and $g(x) = -x + 3$. On the same set of axes below, draw the graphs of $y = f(x)$ and $y = g(x)$.

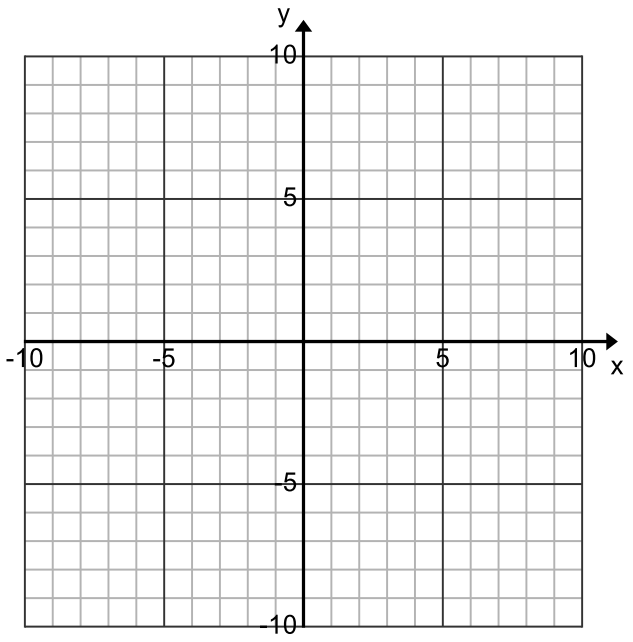


a. Using this graph, determine and state *all* values of *x* for which $f(x) = g(x)$.

b. Now, solve the system **algebraically**.

4. Solve the following system of equations graphically.

$$\begin{cases} p(x) = \sqrt[3]{x} + 2 \\ s(x) = x + 2 \end{cases}$$



Check your solutions.

5. A sports equipment store is having a sale on soccer balls. A soccer coach purchases 10 soccer balls and 2 soccer bags for $155. Another soccer coach purchases 12 soccer balls and 3 soccer bags for $189.

   a. Write a system of equations that can be used to find the cost of one soccer ball and one soccer bag.

   b. Using these equations, determine and state the price of a soccer ball and price of a soccer bag to the nearest cent.

   c. If a third coach has $200 to spend on soccer equipment, could he get 13 soccer balls and 3 soccer bags? Explain your reasoning.

6. A gardener is planting two types of trees:

   Type A is three **feet** tall and grows at a rate of 15 **inches** per year.

   Type B is four **feet** tall and grows at a rate of 10 **inches** per year.

   Algebraically determine exactly how many years it will take for these trees to be the same height.

7. Solve the following quadratic-linear system **algebraically**.

$$\begin{cases} y = 2x^2 + 4x - 6 \\ y = 2x + 6 \end{cases}$$