

MATH 1650: SECTION 8.7: SYSTEMS OF EQUATIONS

RECALL: A solution to a **system** of equations involving the variables x and y is an ordered pair (a, b) so that when $x = a$ and $y = b$, **both** equations are true. Geometrically, we are looking for the **intersection points** of the graphs of the equations.

STRATEGIES:

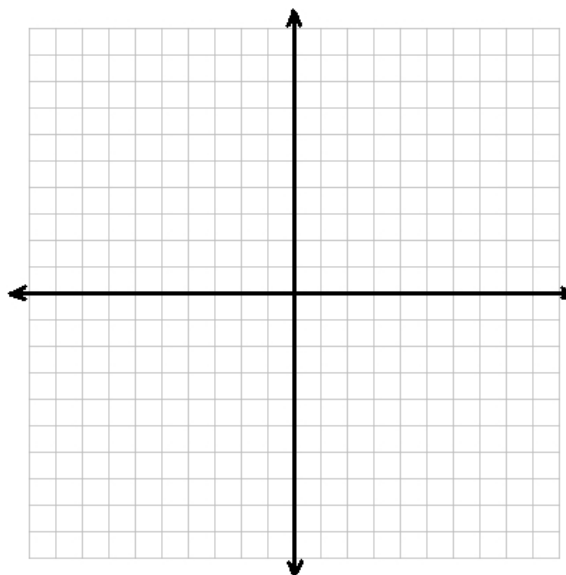
- **SUBSTITUTION:** Solve one equation for one variable in terms of the other and substitute into the other equation. This produces a new equation with only one variable ...
- **ELIMINATION:** Add equations to eliminate one of the variables ...

NOTE: You can multiply an equation by a nonzero number to help cancel out terms.

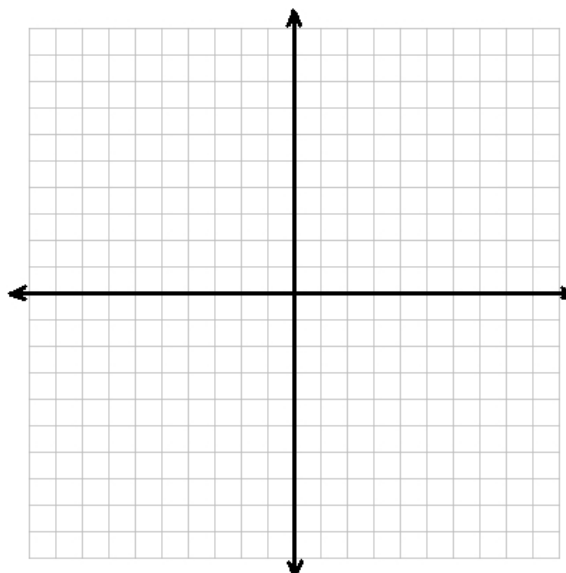
EXAMPLE: Solve the following systems of equations using substitution or elimination. Check your answers.

HINT: It often helps to graph both equations first to help you see how many solutions to expect!

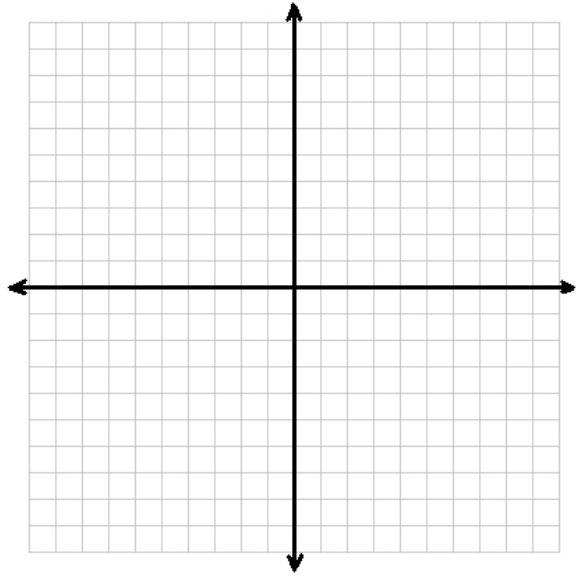
1.
$$\begin{cases} x^2 + y^2 = 4 \\ 4x^2 + 9y^2 = 36 \end{cases}$$



2.
$$\begin{cases} x^2 + y^2 = 4 \\ 4x^2 - 9y^2 = 36 \end{cases}$$



$$3. \begin{cases} x^2 + y^2 = 4 \\ y - 2x = 0 \end{cases}$$



$$4. \begin{cases} x^2 + y^2 = 4 \\ y - x^2 = 0 \end{cases}$$

