4.1 Systems of Equations Practice Problems

1. Solve each of the systems of equations below by the method of your choice. If there are infinitely many solutions, find 3 solutions. If there are more than one solution and not infinitely many, find all of them.

(a)
$$\begin{array}{rrrcr} x & - & y & = & 2 \\ 2x & + & 3y & = & 9 \end{array}$$

(b)
$$\begin{array}{rrrcr} 2x & + & y & = & -1 \\ x & - & 2y & = & -8 \end{array}$$

(c)
$$\begin{array}{rrrcr} x & - & 5y & = & 10 \\ y^2 & + & 3y & = & x - 2 \end{array}$$

(d)
$$\begin{array}{rrrcr} 6x & + & 4y & = & 10 \\ 9x & + & 6y & = & 15 \end{array}$$

(e)
$$\begin{array}{rrrcr} 5x & + & y & = & -1 \\ x & - & 5y & = & -4 \end{array}$$

(f)
$$\begin{array}{rrrcr} 6x & + & 4y & = & 10 \\ 3x & + & 2y & = & -2 \end{array}$$

(g)
$$\begin{array}{rrrcr} & & y & = & 7 \\ 3x & - & 2y & = & 11 \end{array}$$

2. Suppose you have a system of equations where the graph of one equation is a circle and the graph of the other equation is a line. How many solutions are possible?

3. Suppose you have a system of equations where one equation is $y = |x|$ and the other equation is a line. How many solutions are possible?

4. Find the intersection points of the graphs of $x = 1$ and $y = 5$.

5. Find the intersection points of the graphs of $y = x^2$ and $y - 2x = 1$.