MPM2DG **Solving Linear Systems by Graphing – Practice**

1. Without graphing, analyze each system to determine whether the system has one solution, no solution, or infinitely many solutions.

(a) $\begin{cases} 2x+y=6 \\ y-8=-2x \end{cases}$ (b) $\begin{cases} 3x+y=1 \\ 6x+2y=2 \end{cases}$ (c) $\begin{cases} 2x+y-4=0 \\ x+2y-6=0 \end{cases}$

2. Write a system of equations that has the point (3, 2) as
(a) the only solution (b) one of infinitely many solutions

3. If (0, 3) and (2, 4) are both solutions to a system of two linear equations, does the system have any other solutions? Explain.

4. Sketch a graph to represent a system of two equations with one solution, so that the two lines have:
(a) different x-intercepts and different y-intercepts
(b) the same x-intercepts but different y-intercepts
(c) different x-intercepts but same y-intercept
(d) the same x-intercept and the same y-intercept

5. Solve the following systems graphically:
(a) $\begin{cases} x-2y=6 \\ 3x+y=11 \end{cases}$ (b) $\begin{cases} x-y=-2 \\ 4x+2y=16 \end{cases}$ (c) $\begin{cases} x-2y=10 \\ 3x-y=0 \end{cases}$

6. Ian owns a small airplane. He pays \$50/h for flying time and \$300/month for hangar fee at the local airport. If Ian rented the same type of airplane at the local flying club, it would cost him \$100/h. How many hours will Ian have to fly each month so that the cost of renting will be the same as the cost of flying his own plane?

7. Which is the point of intersection of the lines $y=3x+1$ and $y=-2x+6$?
(a) (0, 1) (b) (1, 1) (c) (1, 4) (d) (2, 5)

Challenge:
The lines $y=mx+1$, where m is a positive integer, and $13x+9y=183$ intersect at a point P. The number of values of m, for which the coordinates of P are integers, is

(A) 0 (B) 1 (C) 2 (D) 5 (E) more than 5

Answers:
1. Hint: rewrite both equations in $y=mx+b$ form.
(a) no solution (b) infinitely many solutions (c) one solution

5. (a) (4, -1) (b) (2, 4) (c) (-2, -6)
6. 6 hours
Challenge: (B)