

• **Conclusions:**

If x and y satisfy

$$\begin{cases} x - 2y = -4 \\ 2x - 3y = -5 \end{cases},$$

then $x = 2$ and $y = 3$.

We can check our solution by substituting it in each of the two equations:

$$\begin{cases} 2 - 2 \cdot 3 = -4 \\ 2 \cdot 2 - 3 \cdot 3 = -5 \end{cases}$$

both of which are true, so the solution is $(2, 3)$.

Note: if the solutions are complicated, we should at least check on a graph if they are approximately correct.

17.3 Problems (6 pt Problems)

1. Solve

$$\begin{cases} 3x - y = 1 \\ 2x - 3y = -2 \end{cases}$$

2. Solve

$$\begin{cases} 3x - 5y = 1 \\ 2x - 3y = -5 \end{cases}$$

3. Suppose that two fireworks are to be launched three seconds apart. If the height in feet at t seconds of the first firework is given by $h = -16t^2 + 160t$ and the height in feet at t seconds of the second firework is $h = -16(t - 3)^2 + 160(t - 3)$, at what time will they be at the same height? What is their height at that time?

17.4 Exercises

1. Solve

$$\begin{cases} x = 3y - 1 \\ 2x - 3y = -2 \end{cases}$$

2. Solve

$$\begin{cases} 3x - 5y = -1 \\ 2x - 3y = -2 \end{cases}$$

3. Solve

$$\begin{cases} 3x - 6y = 2 \\ 2x - 4y = -3 \end{cases}$$

4. Solve

$$\begin{cases} 3x^2 - 2y & = 2 \\ 2x - 4y & = -3 \end{cases}$$

5. Solve

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

6. Solve

$$\begin{cases} x^2 + y^2 & = 2 \\ x^2 + y^2 & = 3 \end{cases}$$

7. If there is a solution which is 3 parts water to 1 part salt and another solution has 4 parts water to 1 part salt, how much of the first and second solutions should you combine to have 3 gallons of a 10 part water to a 3 part salt solution?

8. Suppose you and your friend go to a fruit stand which sells apples and bananas (by item and not weight). You buy 3 bananas and an apple and your friend buys two apples and 2 bananas. Your receipts show that you spent 2 dollars and your friend spent 3 dollars. How much money would I need to buy 2 bananas and 7 apples?