

**Math 301 : Homework #0**  
Due Thursday, Aug 28, start of class

How many solutions do the following equations or systems of equation have? Some equations may have no solutions, exactly one solution or an infinite number of solutions. Give a geometric interpretation if you can.

- If the problem has exactly one solution, please provide that solution, either as a scalar, or as a pair of numbers. The first three problems have exactly one solution. Try to find it by any means you can.
- If the system has an infinite number of solutions, try to describe the solutions as best as you can.
- If the system doesn't appear to have a solution, explain why you believe there is no solution. You do not have to provide a "best" answer.

1. (has exactly one solution)

$$3x = 5$$

2. (has exactly one solution)

$$\begin{aligned} 2x + 4y &= 1 \\ x - 2y &= 3 \end{aligned}$$

3. (has exactly one solution)

$$\begin{aligned} x + 640 &= y + 310 \\ y + 450 &= z + 610 \\ z + 520 &= w + 480 \\ w + 390 &= x + 600 \end{aligned}$$

- 4.

$$\begin{aligned} 2x - y &= 1 \\ 4x - 2y &= 3 \end{aligned}$$

- 5.

$$\begin{aligned} 2x - y &= 1 \\ 4x - 2y &= 2 \end{aligned}$$

- 6.

$$\begin{aligned} 2x + y &= 1 \\ 4x - 3y &= 2 \\ x + y &= 5 \end{aligned}$$

7.

$$\begin{aligned}2x + y &= 1 \\3x + 2y &= 6 \\x + y &= 5\end{aligned}$$

8.

$$4x + 5y = 1$$

9.

$$\begin{aligned}3x &= 1 \\x &= 7\end{aligned}$$

10.

$$\begin{aligned}2x &= 4 \\x &= 2\end{aligned}$$

11.

$$0x = 6$$

12.

$$6x = 0$$

13.

$$0x = 0$$

14.

$$\begin{aligned}2x &= 4 \\0x &= 0\end{aligned}$$