

1. Consider the following system of equations where a is an unknown parameter,

$$ax + 3y = -3$$

$$4x + 6y = 6.$$

(a) 4 points. Can you find a value of a for which the linear system has one solution? If so, give the value of a and solve the system. EXPLAIN YOUR ANSWER.

~~If the 2 equations represented the same line~~
~~there is~~

$$a = 0$$

$$3y = -3 \Rightarrow y = -1$$

$$4x + 6(-1) = 6$$

$$4x - 6 = 6$$

$$4x = 12$$

$$x = 3$$

For any
 value $a \neq 2$
 the system
 will have a
 unique solution.

When $a = 0$, $\begin{pmatrix} 3 \\ -1 \end{pmatrix}$ is a solution.

(b) 4 points. Can you find a value of a for which the linear system has no solution? If so, give the value of a . EXPLAIN YOUR ANSWER.

If the lines are parallel, the solution to the system will not exist, since the lines will never intersect.

If $a = 2$, $2x + 3y = -3$ is parallel to

$$4x + 6y = 6$$

(c) 2 points. Can you find a value of a for which the linear system has more than one solution? If so, give the value of a . EXPLAIN YOUR ANSWER.

It is NOT possible for THIS linear system to have an infinite # of solutions, because there is no value of a which makes $ax + 3y = -3$ identical to $4x + 6y = 6$

Since -3 on the right hand side can not equal 6 ,
 The parameter a only affects slope, not intercepts of