Systems of Linear Equations

Begin Warm-Up

Test Taking Section: On Graph Paper (if possible)

1) Graph y = 3/2 x – 3 on a coordinate plane • $m = \frac{3}{2}$, $b = -3$

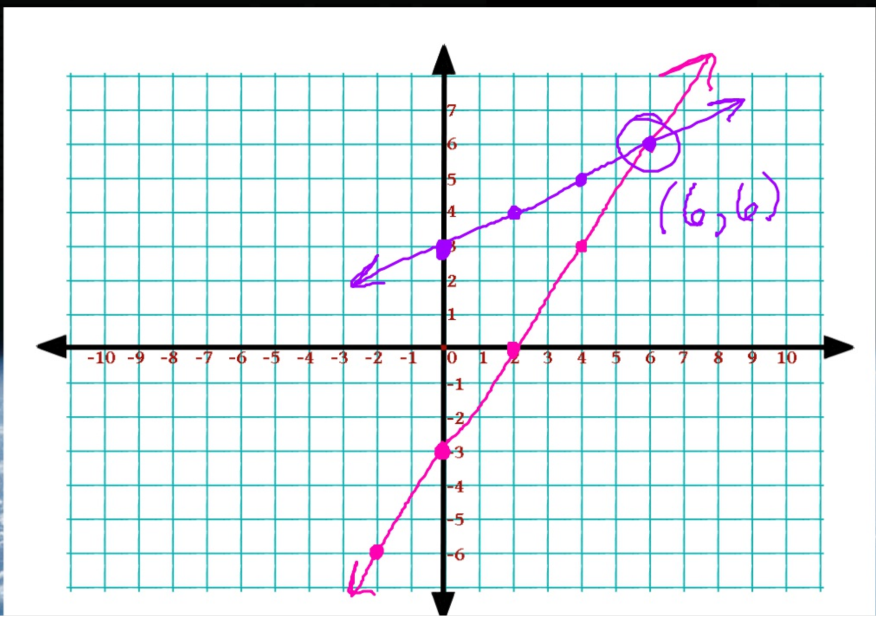
2) Graph -2x +4y = 12 on a coordinate plane

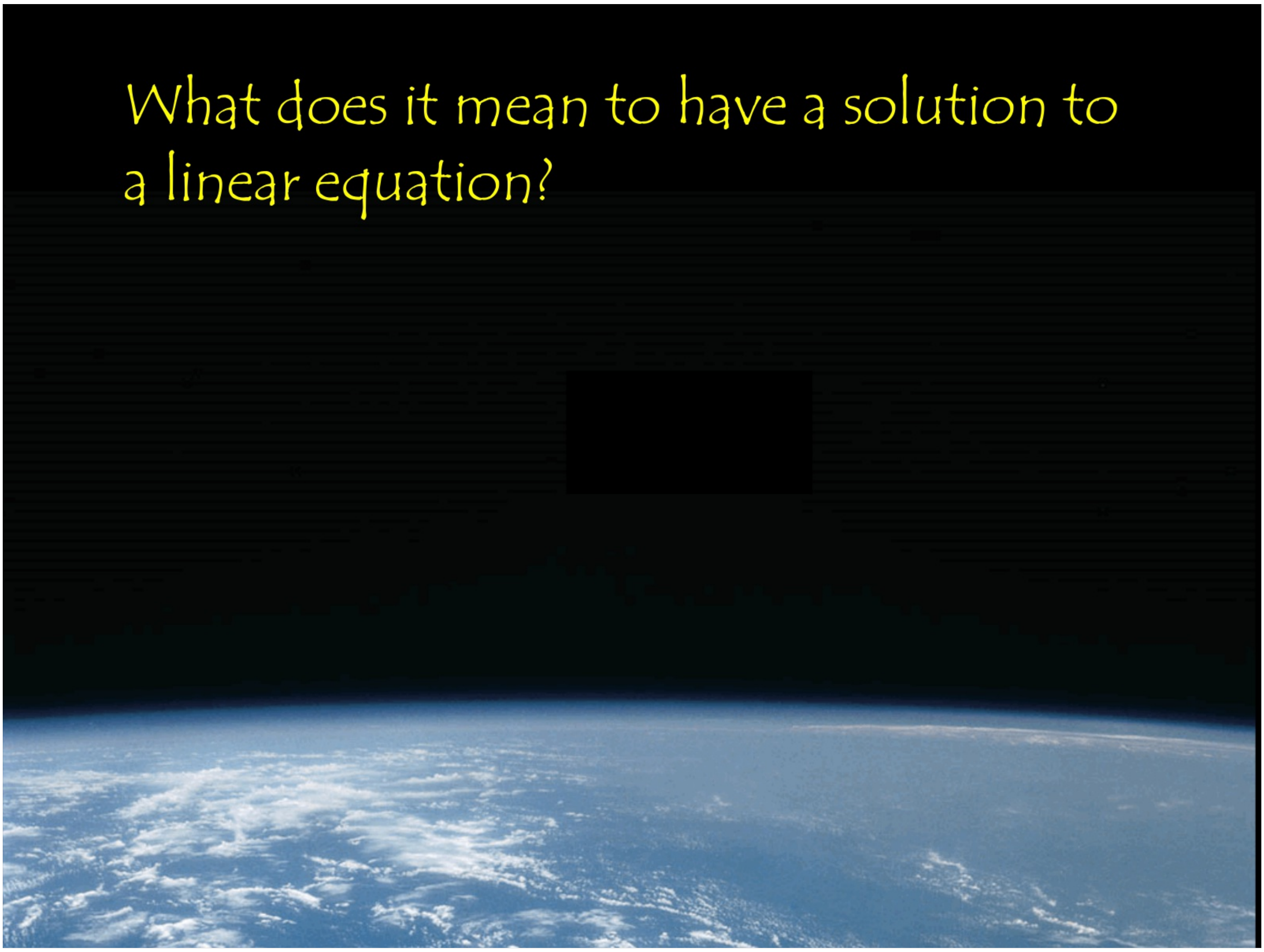
• $-2x + 4y = 12$

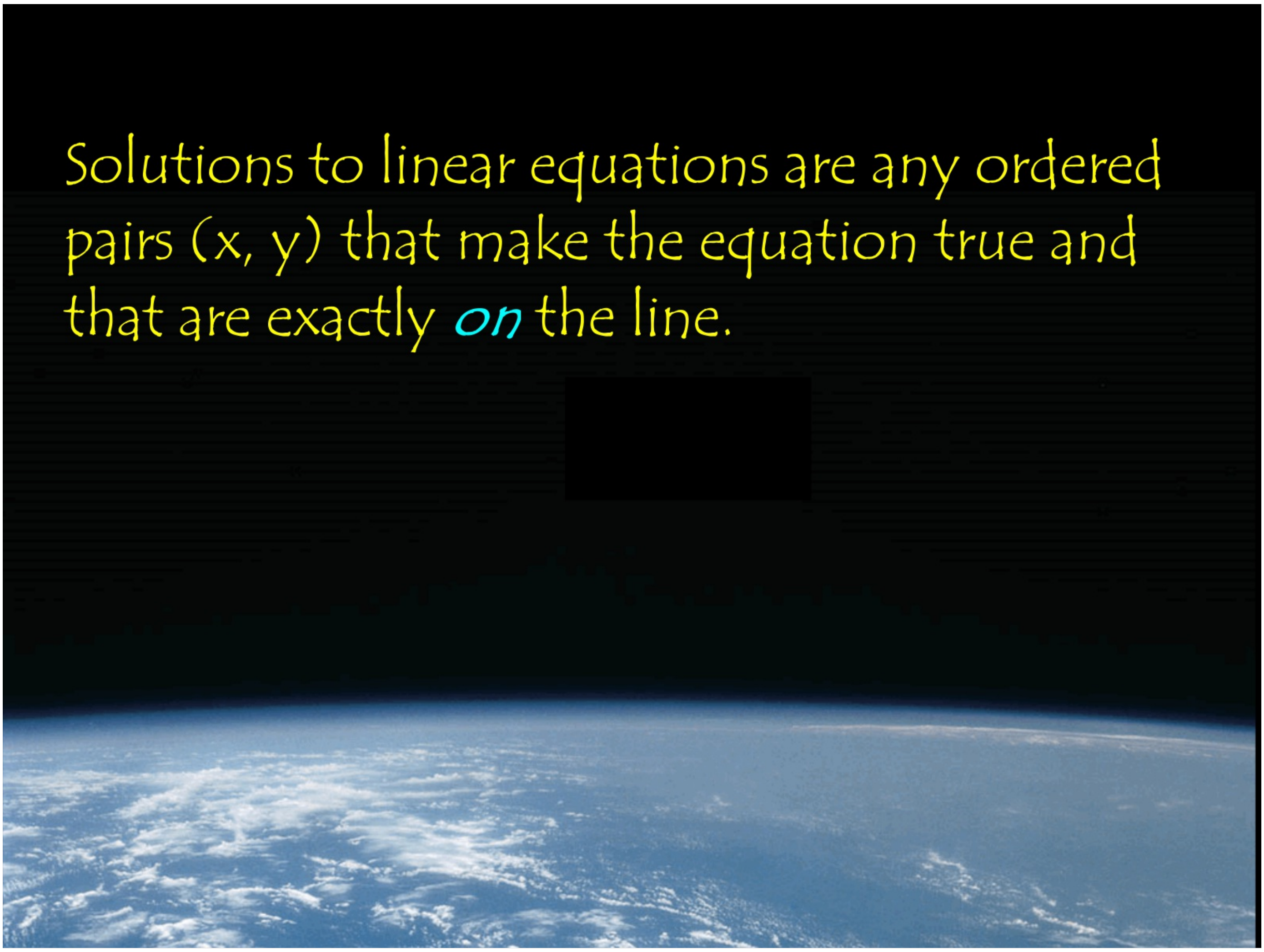
$4y = 2x + 12$

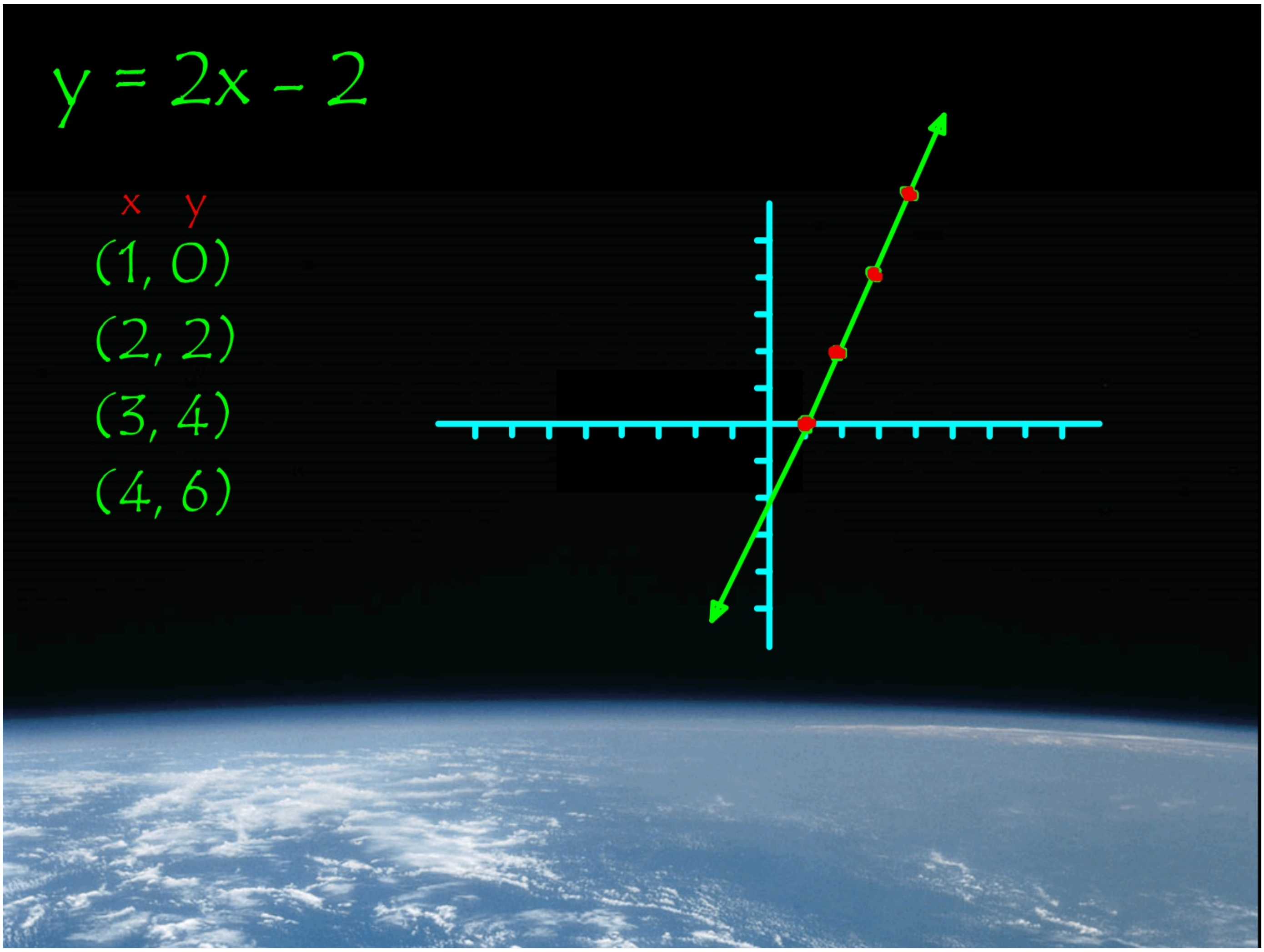
$y = \frac{1}{2}x + 3$

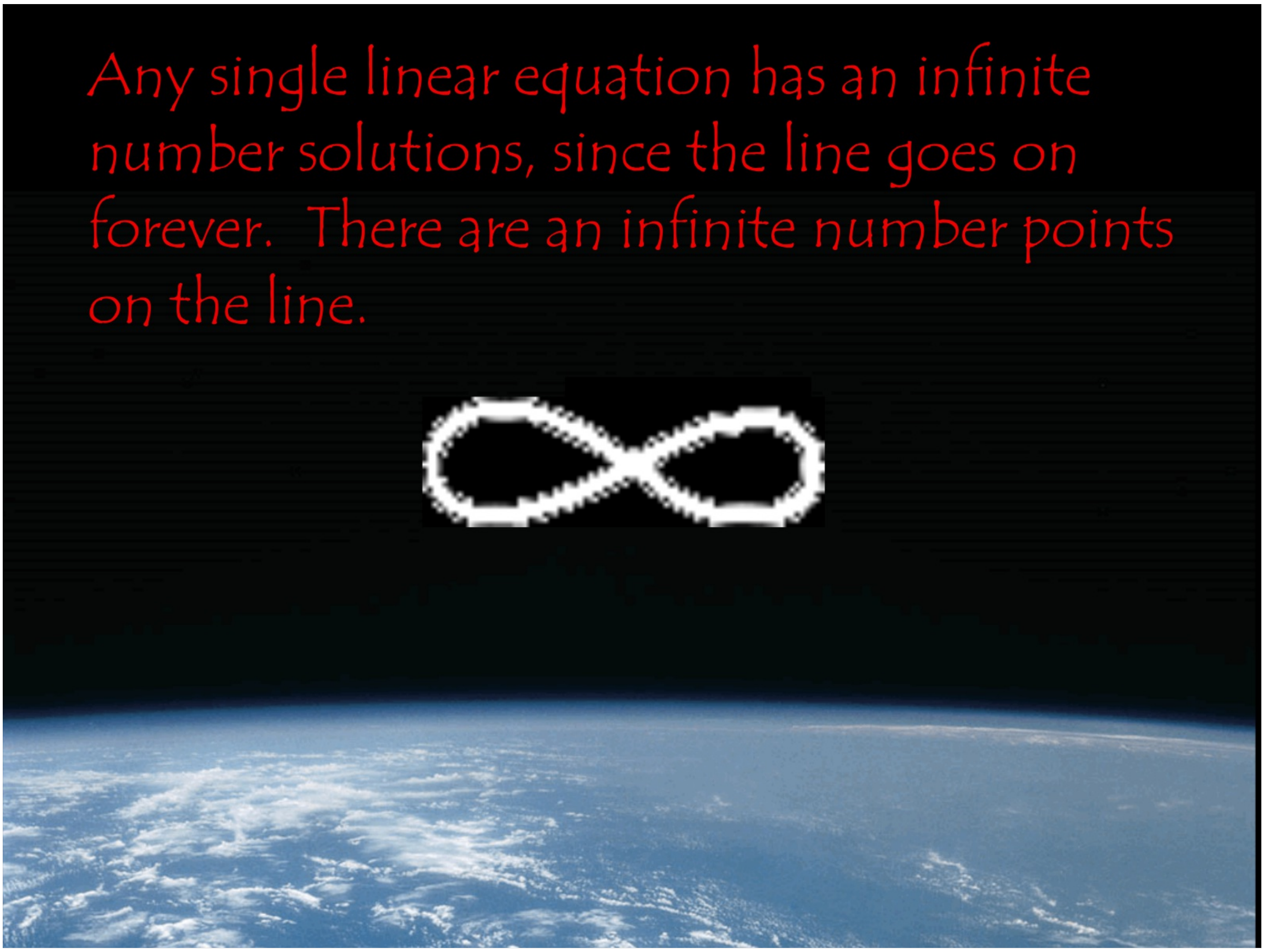
$m = \frac{1}{2}$, $b = 3$

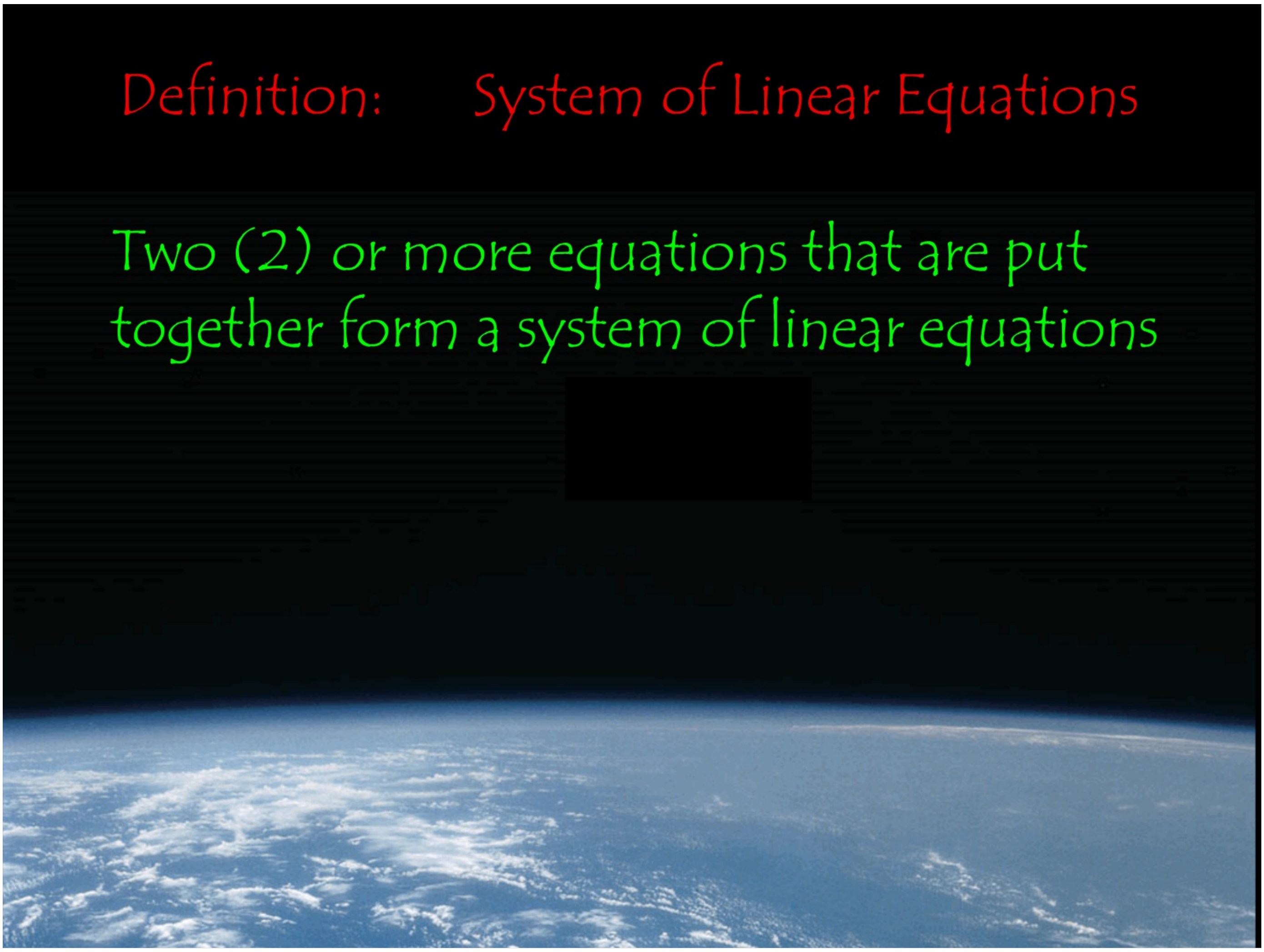


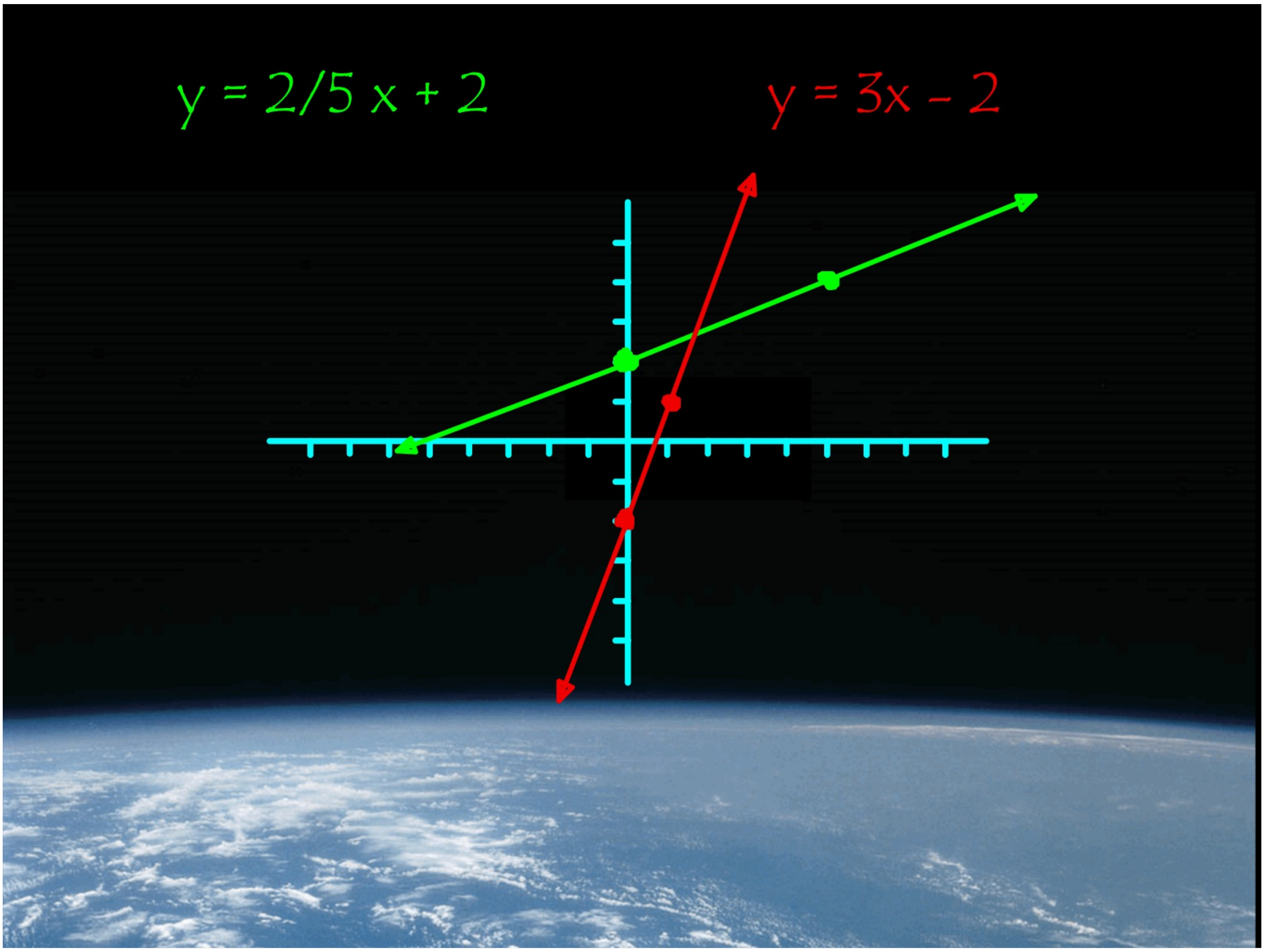

What does it mean to have a solution to a linear equation?


Solutions to linear equations are any ordered pairs (x, y) that make the equation true and that are exactly *on* the line.


y = 2x - 2
x y
(1, 0)
(2, 2)
(3, 4)
(4, 6)


Any single linear equation has an infinite number solutions, since the line goes on forever. There are an infinite number points on the line.

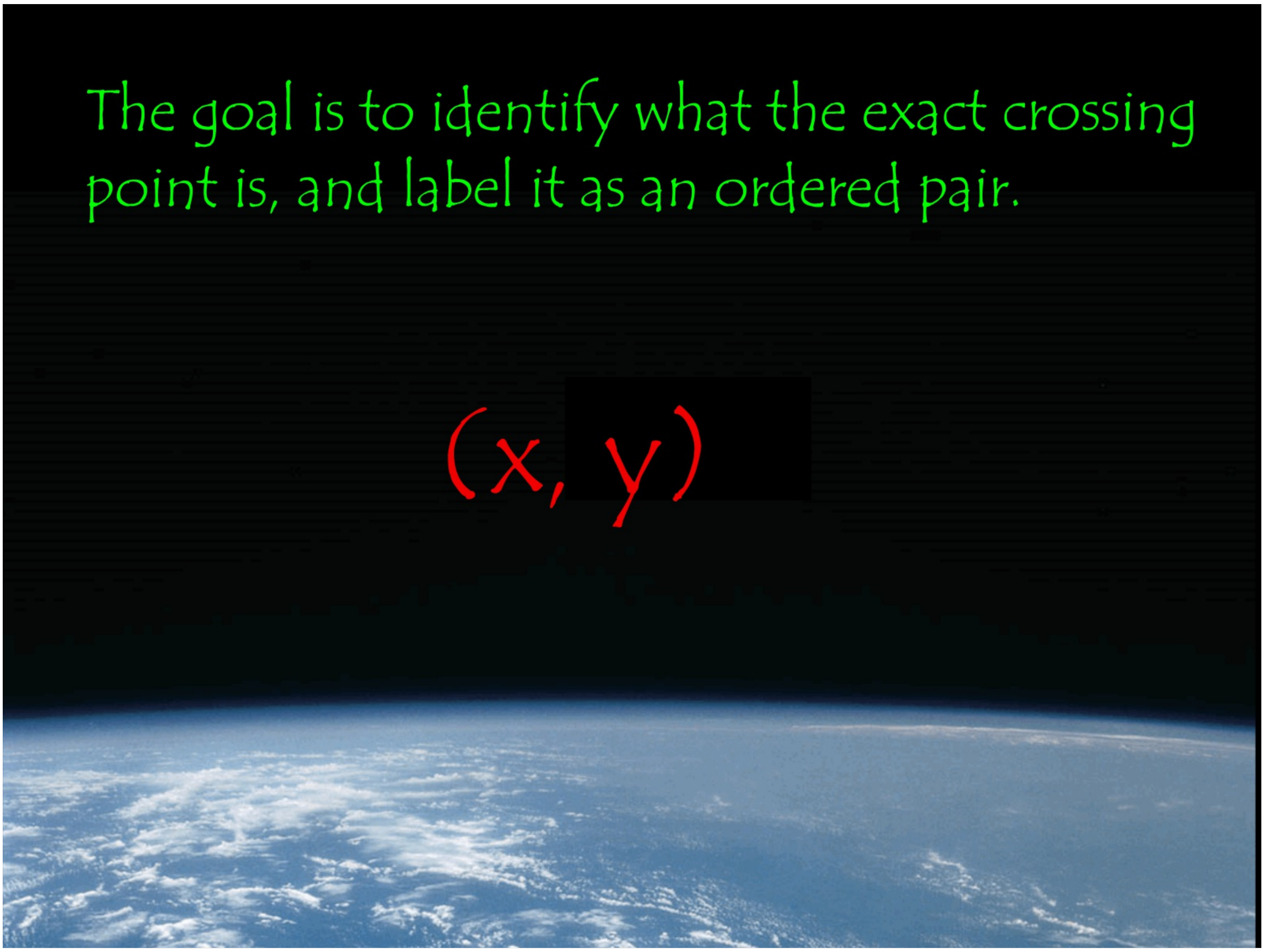

Definition: System of Linear Equations
Two (2) or more equations that are put together form a system of linear equations



y = 2/5 x + 2
y = 3x - 2

Definition: Solution to a system of linear equations

Any ordered pair that makes both equations within the system true. The point where the lines cross is the solution to that particular system of equations.


The goal is to identify what the exact crossing point is, and label it as an ordered pair.
(x, y)

Solving Systems of Linear Equations by Graphing

Solving Systems by Graphing

1. Graph **both equations** on the **same graph** using slope-intercept form.

2. The ___intersection___ of the lines is the **solution** of the system.

→ A solution of the system makes ___both___ of the equations true!

3. If the lines are **parallel**, there is ___no solution___.

4. If the equations create the **same line**, there are ___infinitely many solutions___.

Example:

x + y = -1

$y = -x - 1$

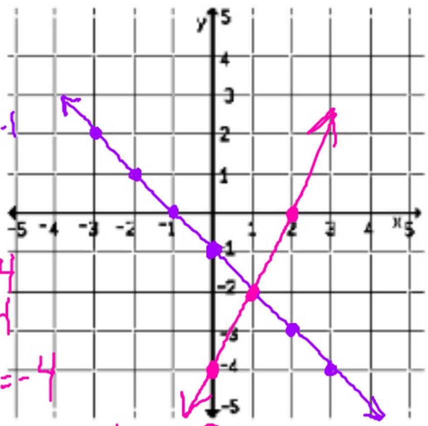
$m = \frac{-1}{1}, b = -1$

2x - y = 4

$-y = -2x + 4$

$y = 2x - 4$

$m = \frac{2}{1}, b = -4$



SOLUTION: (1 , -2 **)**