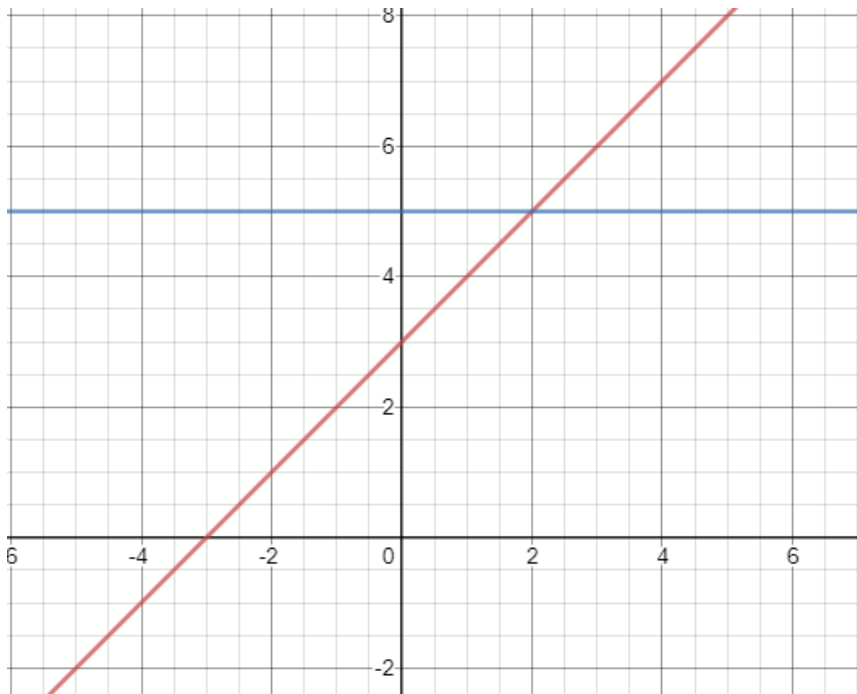Intro to Systems of Equations   [Set 15]

Remember from unit 1 that an equation is **two lines** that represent a set of information. When we solve for x we find the x value of where the two lines cross. Checking our answer by substituting it back in will produce the y value of the point where the two lines intersect.

Solving x +3 = 5   is looking at the two lines   y = x + 3

$$Y = 5$$

As you can see the two lines cross at the point (2,5)

- If you solve the equation you get x = 2
- If you substitute 2 back in to the original problem you get (2) + 3 = 5   so y = 5

YOU TRY:

For the following equations write the two lines and use **desmos.com** to graph the two lines on the same coordinate plane. Give the intersection point.

1.   X – 2 = -4   Line 1 is y = _____   Intersection point is _____
                               Line 2 is y = _____

2.   3x-1 = x + 5   line 1 is y = _____   Intersection point is _____

                               Line 2 is y = _____

3. −x − 7 = -5   Line 1 is y = _____   Intersection point is _____

   Line 2 is y = _____

4. 4x + 2 = x − 10   Line 1 is y = _____   Intersection point is _____

   Line 2 is y = _____

5. 2x + 4 = 2x+ 7   Line 1 is y = _____   Intersection point is _____

   Line 2 is y = _____

6. 3x - 2 = 3x - 2   Line 1 is y = _____   Intersection point is _____

   Line 2 is y = _____

The number of **Solutions** is the number of times the two lines intersect.

- Problem #'s 1-4 had 1 SOLUTION because the two lines crossed once.
- Problem # 5 had NO SOLUTION because the two lines never crossed (Parallel lines)
- Problem #6 had INFINITE SOLUTIONS because the two lines are the same they will touch everywhere.

Use *desmos.com* to determine the number and value of the solution.

7. X − y = 3   Number of solutions? _____   8. 6x+8y = -22   Number of solutions? _____
   7x − y = -3   Solution point. _____   y = -5   Solution point. _____

9. -8x-10y = 24   Number of solutions? _____   10. -9 + 5y = -4x   Number of solutions? _____
   6x + 5y = 2   Solution point. _____   -11x = -20 + 9y   Solution point. _____

11. X + y = 4   Number of solutions? _____   12. X + 2y = 5   Number of solutions? _____

    2x + 2y = 8   Solution point. _____ $y = \frac{-1}{2}x - 4$ Solution point. _____