Slope-intercept form, points on lines, and parabolas - Reva Cork

A function is a box. You plug a number x into it, and it produces a number y. We can write valid inputs and outputs as an ordered pair of numbers (x,y), where x is the number we put in, and y is the number we got out.

One simple function is y = x. When you plug a number into x, the function gives you the same number back. When you put in 1, it puts out 1. Plug in 0, then y = 0. When x = -1, y = -1. If we graph those points (and a few more, like (2,2), (3,3), etc) onto a coordinate grid, we get something that looks suspiciously like a line. If we plugged decimal or fraction values into the function, it would spit out decimal or fraction values back. We can connect all of these dots, and every value on that line is a valid (x,y) pair that fits our function.

Welcome to the fine art of plugging various things into formulas.

- Graphs, and points on those lines.
    - y=x (-1,-1)(0,0) (1,1) (2,2)
- How y=x looks shifted +1, +2, -1, -2, +0.
    - Note that raising it is equivalent to moving it left..
    - Lowering it is equivalent to moving it right.
- how y=x looks when the slope is modified. Rise Over Run. Keep in mind 3 = 3/1.
    - y=3x, y=2x, y=x, y = 1/2 x, y = 0x, y=-1/2x, y=-x, y=-2x, y=-3x.
    - how y=?x looks when ? gets closer and closer to 0. (flatter and flatter line, horizontal)
    - how y=?x looks when ? gets closer and closer to ∞. (steeper and steeper line, vertical)
- how y=x looks when both, in Slope Intercept Form.
    - y=2x+1, y=2x, y=2x-2
    - y=3x+1, y=3x, y=3x-1

-- How to plug a point into a formula to see if it is on that line. Plugging a number in to get the other coordinate at that X/Y value.

-- How to find the intersection of two lines -- AKA plugging one formula into another.

-- "Zeroes" and X and Y intercepts. AKA, where the line crosses the X or Y axis, and what that means.

-- The shapes of exotic beasts. If the biggest power is even, the ends point in the same direction (like a parabola). If the biggest power is odd, they point in opposite directions. If the biggest power's coefficient is positive, the graph's left side trails off to infinity downwards. If it's negative, it trails off to infinity upwards.