

Pre-Lecture Lesson

To get you ready for the talk we're going to review a few concepts.

Sequences

A sequence is a list of numbers that are in a special order. They follow a specific pattern from one number to the next.

Can you find the pattern in these sequences?¹

3, 5, 7, 9, ... (the dots mean the list continues forever – to infinity)

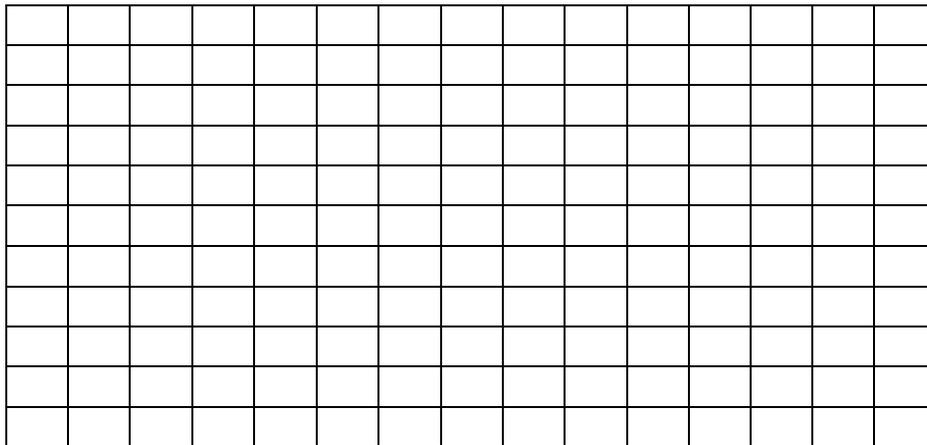
5, 10, 15, 20, ...

7, 11, 15, 19, 23, ...

3, 11, 35, 107, ... (this one involves more than one operation)

Drawing Shapes on Graph Paper

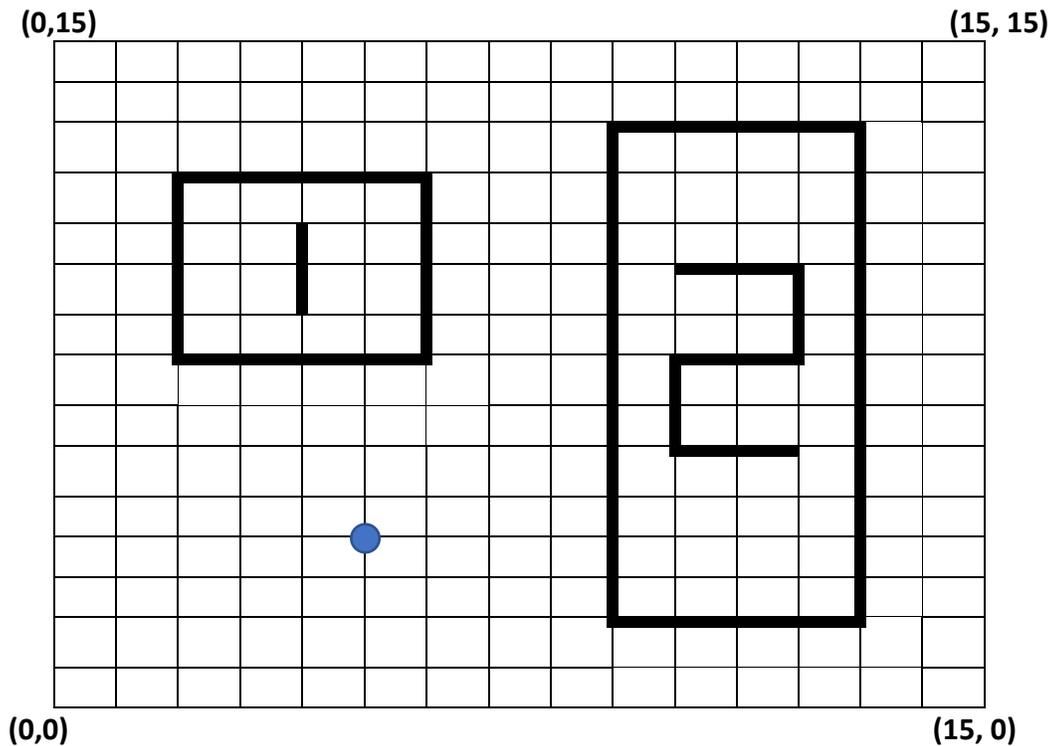
Take a few moments and practice drawing squares and rectangles on this grid (or get a bigger piece of graph paper to practice on). You can draw interlocking / overlapping shapes.



Practice calculating the area and perimeter of your shapes.

¹ **Answer:** first sequence starts at 3 and goes up by 2 each new number; second sequence starts at 5 and goes up by 5 each new number; third sequence starts at 7 and goes up by 4 each time; last sequence starts at 3 and each new number is the number before multiplied by 3 with 2 added to it ($3 * 3 = 9 + 2 = 11$; $11 * 3 = 33 + 2 = 35$; $35 * 3 = 105 + 2 = 107, \dots$)

Positions on a Grid



What are the coordinates (or corners) of the square (1) and the rectangle (2)?²

Hint: start at the bottom corner (0,0) and count right (that's the first number) and then up (that's the second number). Example: the circle is at (5, 4). Now do this for each of the corners of the square and the rectangle.

Distances

What is the distance between the upper left corner of the square (1) and the lower right corner of the rectangle (2)?³

If you've learned the Pythagorean theorem you can use the coordinates of the points and the following formula:

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Or you can just use a ruler to measure.

² The square has its 4 corners at (2, 8), (2, 12), (6, 8) and (6, 12). The rectangle at (9, 2), (9, 13), (13, 2), and (13, 13)

³ Using the formula we have points (2, 12) and (13, 2), so $x_1 = 2$, $x_2 = 13$, $y_1 = 12$, and $y_2 = 2$

$$\sqrt{(13 - 2)^2 + (2 - 12)^2} = \sqrt{11^2 + (-10)^2} = \sqrt{121 + 100} = 14.87$$