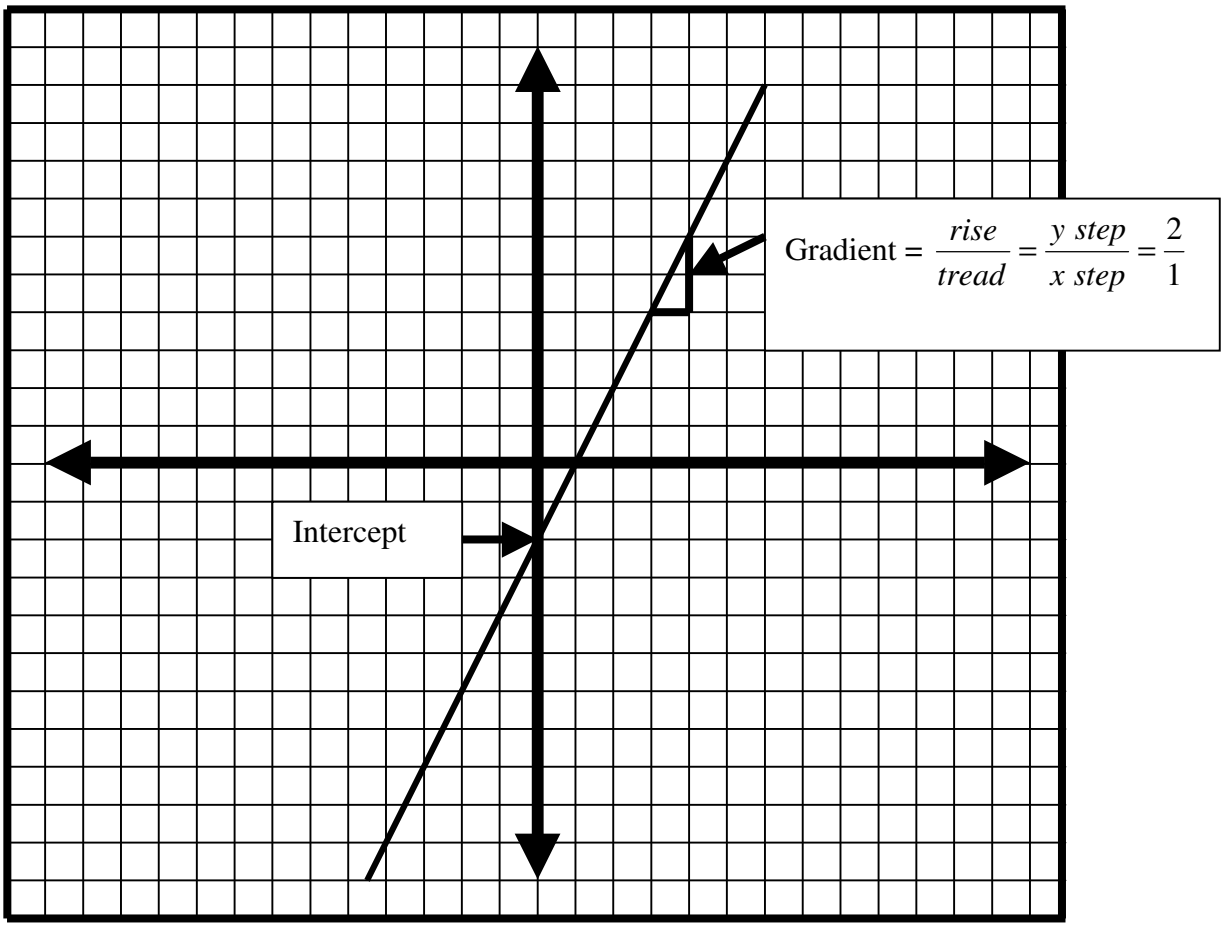
Gradient and intercept

- Use **1 square to 1 unit** on the grid below and label your axes
- The line shown on the grid below shows the graph of $y = 2x - 2$
- At what Y value does the graph **cross the Y axis**? This is called the **intercept**
- If you go along one square, how many squares does the line go up? That is called the **gradient** and is a measure of how steep the graph is



Try these

- Plot the following formulas on the grid above and label each line with the formula

$y = x - 2$ $y = 2x + 1$ $y = 3x - 4$ $y = -2x + 4$

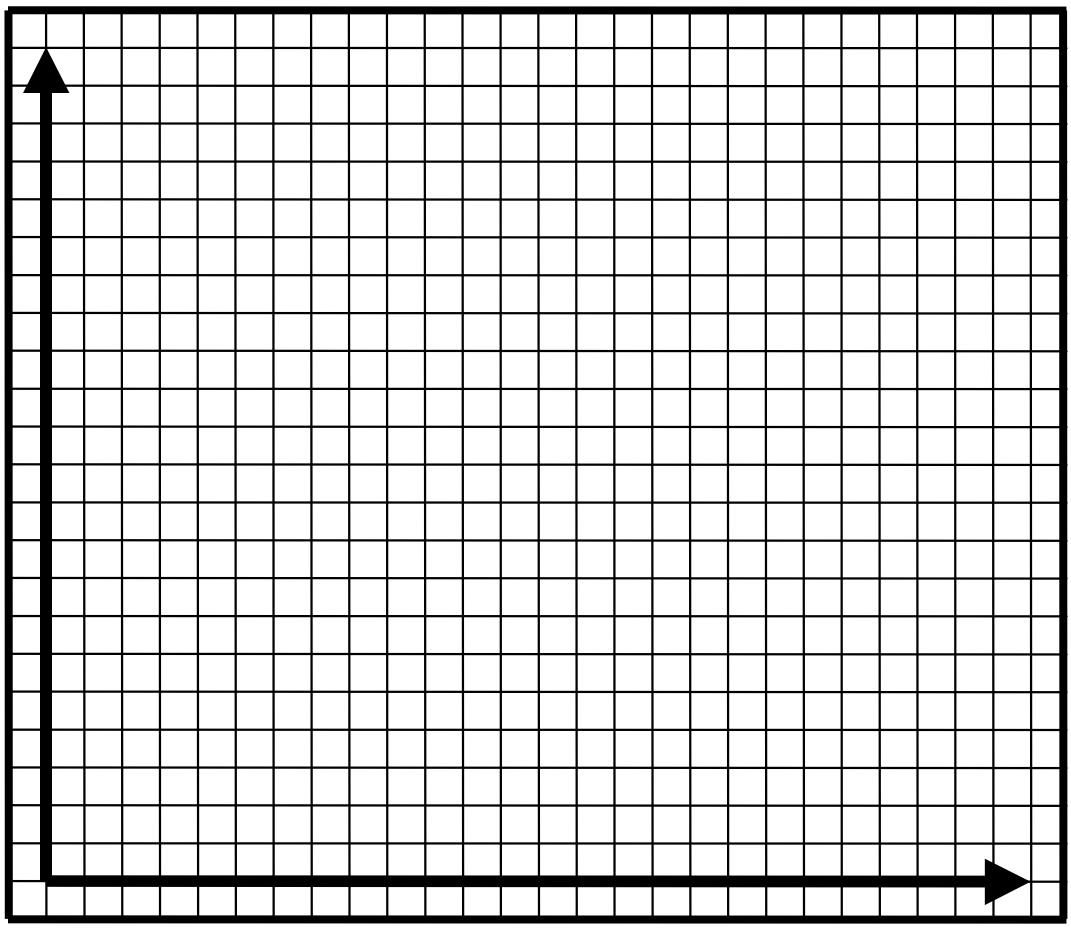
- In each case draw a triangle like the one above and check that the gradient is the same as the **coefficient** of X in the formula and that the intercept is the same as the **constant**
- Note that a **negative coefficient** of X means that the graph is going 'downhill'
- You can use a **larger triangle** to get a more accurate gradient from data where there is some scatter and you have had to draw a 'line of best fit'….

Real data with scatter

- Below is some experimental data
- Plot this on the first quadrant grid shown below using a suitable scale for the X and Y axes and label the axes

X	1	2	3	4	5	6	7	8	9	10
Y	4	6	8	10	11	15	15	18	19	22

- Draw a **'line of best fit'** through the data as if you were plotting a scatter diagram (which you are)
- At what Y value does your line cross the Y-axis? This is the **intercept**.
- Make a **large triangle** at two widely spaced points on your line of best fit. The points you pick do not need to coincide with data points
- Calculate the **gradient** from the formula $gradient = \frac{rise}{tread} = \frac{y\ step}{x\ step}$
- Write a **formula** for the ' line of best fit' you have found.
- The formula will have the **general form** $y = \text{gradient} \times x + \text{intercept}$



I got $y = 1.9515x + 2.0667$ using the MS Excel trend line function…

Check your answers against the model answers - perhaps swap with the person next to you and 'mark' each other's plotting.