1 Line Graphs

1.1 Working out a line between two points

First use $m = \frac{\Delta y}{\Delta x}$, substituting in the coordinates of the two points to find m. Then, substitute this value of m, as well as the coordinates from one of the points, into $y = mx + c$. You can solve to find c, and then you have your line equation.

1.2 Are they parallel?

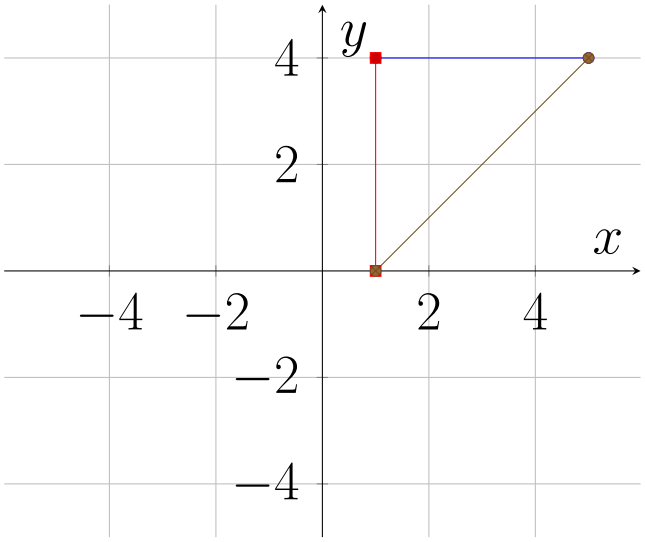
If they have the same gradient, then yes.

1.3 Are they perpendicular?

If their gradients multiply to -1, then yes.

2 Lengths and Areas

To find the distance between two points on a cartesian grid, we can create a right angled triangle and thereby use pythagoras to find the distance. That is to say, for the coordinates $A(x, y)$, and $B(x_1, y_1)$, then the distance between them is equal to $\sqrt{(x - x_1)^2 + (y - y_1)^2}$.



3 Linear models

Linear models can be used to represent the relationships between variables. For example, between a the mass on a spring and its extension, or between the amount of a product / duration of a service and its price.

3.1 Is a linear model suitable?

To find out whether a linear model is suitable for some given data, plot the data on the graph and see if the points fall roughly on a straight line. If they do, an equation can be worked out by using the two given data points that are furthest away for the gradient.

3.2 Explaining variables in linear models

Questions will often require explaining what the gradient and the y-intercept refer to. The gradient can be described as the how much one variable changes per unit of change in the other. The y-intercept differs between

questions. Examples might be the level of one variable when we started measuring, the flat fee charged for the service/product, or something else entirely. This just requires common sense.