

## [Interpreting Axes]

These problems are intended to develop and challenge our intuition when it comes to reading points from graphs.

When reading an axis, we need to take note of a few things, including the quantity or variable being represented on the axis, and if it's numerical, what the scale is. In particular, we need to understand what 'higher' or 'lower' on the axis means.

In this first question, we may instinctively want to interpret the vertical axis as height, since it corresponds to the visual impression of the pictures. So we need to overcome this and read the points as representing taller people if they lie further to the right, and older people if they lie higher.

With these aeroplanes, we've only got a few points to consider, and so the key is just to make a pairwise comparison, being sure to read only one axis at a time.

If we're reading from the horizontal axis, we can say that A is older than B, smaller than B, and has less passenger capacity. Reading from the vertical axis, we have that A has a lower cruising speed, but a longer range. As with the previous example, we just need to take a step back and remember what the axes mean, without any of the visual impression getting the better of us.

With the phone call we're being asked to identify patterns and general trends, as well as points in the data that don't seem to confirm.

In particular, in general we expect the cost of a call to increase as the duration increases.

Sachin's call is cheap. So we might identify that this is a local call, or a call on a special plan where the time spent doesn't matter. It could also just be a call on a cheaper rate.

Then Bailey's call seems to be more expensive. It could be because it's more expensive, or it could be because there is an extra charge added at the beginning.

In identifying the general relationship – longer call means higher cost, this rule can manifest itself in different ways. In this scatter plot, a steeper trend indicates a higher cost per minute, because the cost, which is represented vertically, is increasing more with respect to each minute that passes.

This idea is explored more in the next problem.

Do we expect to see increasing trends? Increased body weight could mean the difference between children and adults. We could also see trends that go up but then go down – because maybe too much weight doesn't mean bigger and stronger, or in some cases body weight may not make a difference.

Then around these general trends, we should always expect some variation.