

Graphing the Cross Section in Excel

It is possible to use Excel to draw the cross-section and calculate the area rather than drawing it by hand on graph paper. If you are going to do it on Excel you should make sure that you understand what the calculations are.

Step 1: Enter your data

Enter your data into an Excel spreadsheet. You will need to make your depth measurements into negative numbers so that the graph is drawn below the zero line.

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
2	Distance (m)	0	1.5	3	4.5	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21	22.5
3	Depth (cm)	0	-0.3	-0.5	-0.7	-0.7	-0.75	-0.75	-0.6	-0.6	-0.72	-0.81	-0.82	-0.57	-0.17	-0.6	0

Step 2: Calculate the Trapezoid

You now need to work out the trapezoid value for each segment of the graph. Create a new row in the table and in cell B4 paste the formula $= (C3+B3)/2$. Then copy this into all the cells in the trapezoid row. This should calculate the values for this row for you.

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
2	Distance	0	1.5	3	4.5	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21	22.5
3	Depth	0	-0.3	-0.5	-0.7	-0.7	-0.75	-0.75	-0.6	-0.6	-0.72	-0.81	-0.82	-0.57	-0.17	-0.6	0
4	Trapezoid	-0.15	-0.4	-0.6	-0.7	-0.73	-0.75	-0.68	-0.6	-0.66	-0.77	-0.815	-0.7	-0.37	-0.39	-0.3	0

Step 3: Calculate the area

To work out the area you now need to take the sum of the trapezoid values and multiply it by the increments in distance. For my example, in a new cell I have entered the formula: $=SUM(B4:Q4)*(L2-K2)$. This gives me a value of: -12.89.

Due to my distance values being in meters & depth in cm I need to multiply this by 100 to get cm^2 .

I also need to change this into a positive number now (the negatives are just for the line on the graph).

So my final area calculation is: $1289 cm^2$

The $(L2-K2)$ is just to calculate the increments - so it could be any adjacent distance cells that you use.

You will have to adapt your formula to fit the number of measurements that you have.

Step 4: Drawing the graph

Now it is time to draw the graph.

Select the distance & depth data, then choose to insert a scatter graph.

Format the graph appropriately (titles, axis legends).

This should produce a graph that looks something like this:

