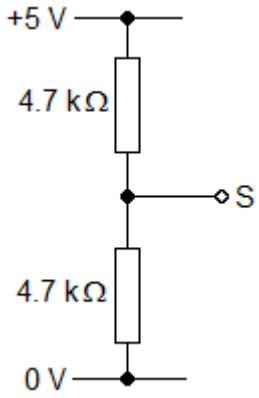
Loading a voltage divider

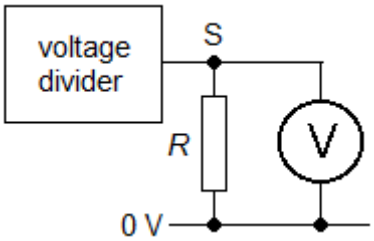
You are going to investigate the effect of drawing current from a signal source.

1

1 Assemble this voltage divider circuit on your breadboard.
The signal at S should be a fixed +2.5 V.

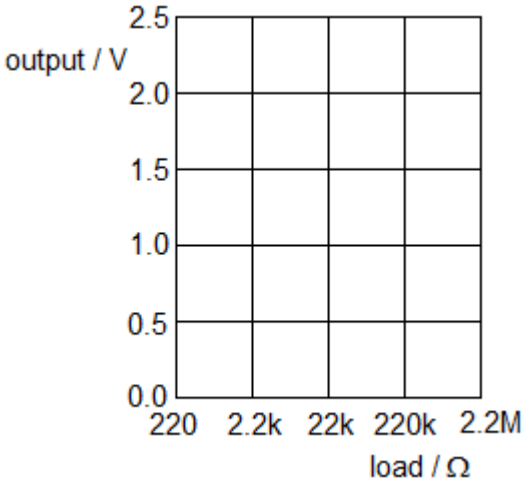


2 Draw current from S with a load resistor *R*, as shown below.
Start off with *R* = 220 Ω. Record the voltage at S (about 0.25 V).



3 Repeat step 2 for the other values of load resistor shown in the table.

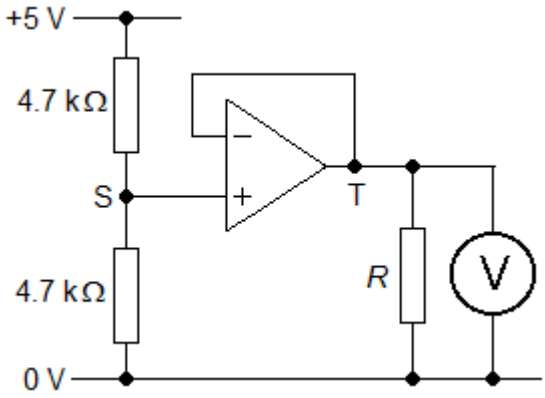
load	output
220 Ω	
2.2 kΩ	
22 kΩ	
220 kΩ	
2.2 MΩ	



4 Plot your measurements on the axes shown. Note the use of a **log scale** to accommodate the large range of values on the horizontal axis. Join up the points and lable the line **S**.

5 Now insert an op-amp voltage follower between the voltage divider and the load. Record the voltage at T for the values of *R* in the table above.

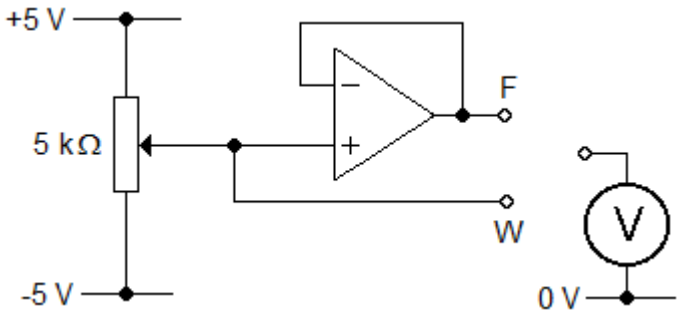
6 Plot the measurements on the axes above. Join up the points and label the line **T**.



Transfer characteristic of a voltage follower

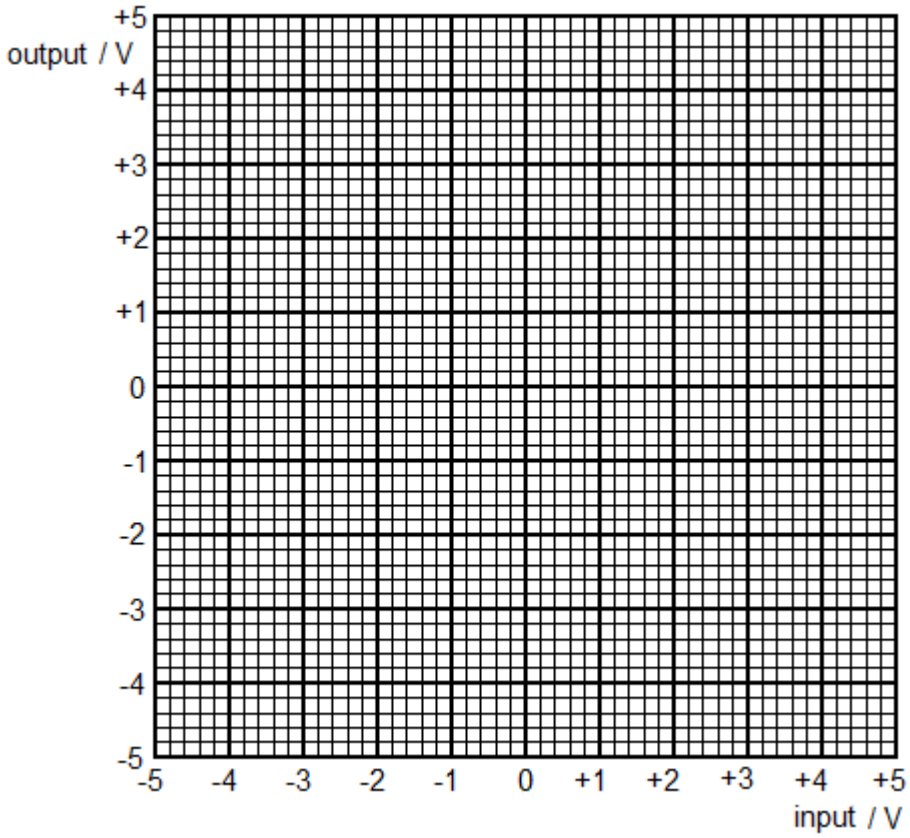
You are going to find out how the output voltage of a voltage follower is related to its input voltage.

1 Assemble this circuit.



2 Connect the voltmeter to W. Check that the voltage at the input of the voltage follower V_{in} can be varied from +5 V to -5 V.

3 Set V_{in} to +5.0 V. Measure the voltage at F, V_{out}. Use these values of V_{in} and V_{out} to plot a point on these graph axes.



4 Reduce the voltage at V_{in} by 0.5 V, measure V_{out} and plot another point on the graph.

5 Repeat step 4 until V_{in} reaches -3.5 V. Join the points with two straight lines, one for the linear region and another for the saturation region. Label the two regions.