Voltage dividers

Often, two resistors are put in series to develop a voltage that is some fraction of the voltage applied across them. Such an arrangement is called a *voltage divider*.

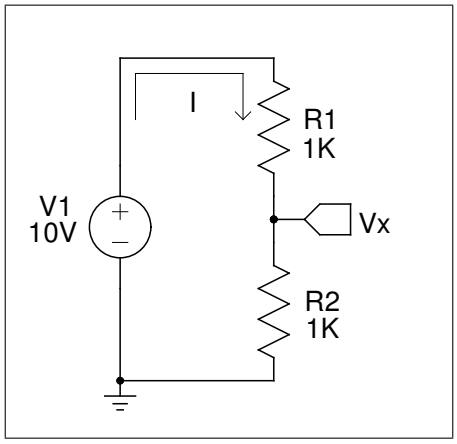

Figure 1: Voltage divider.

To solve for V_x in the general case of a voltage divider:

We know: $V_x = I \times R_2$, so first solve for I

$-V + I_{R_1} + I_{R_2} = 0$ (the KVL loop equation for the circuit)
$I(R_1 + R_2) = V$
$I = (V/(R_1 + R_2))$

Now, knowing I, multiply by R_2 to get V_x.

$V_x = (V/(R_1 + R_2)) \times R_2$, or

$$V_x = \frac{R_2}{R_1 + R_2} \times V_1$$

This is the general form for determining the voltage created by a voltage divider.