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*.



To solve for Vx in the general case of a voltage divider (using the reference designators in the above drawing):

We know: $Vx = I * r^2$, so first solve for I

 $\label{eq:V} \begin{array}{l} -V + Ir1 + Ir2 = 0 \quad (\text{the KVL loop for the circuit}) \\ I(r1 + r2) = V \\ I = (V/(r1 + r2)) \end{array}$

Now, knowing I, multiply by r2 to get Vx.

Vx = (V/(R1 + R2)) * R2, or Vx = R2/(R1 + R2) * V

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