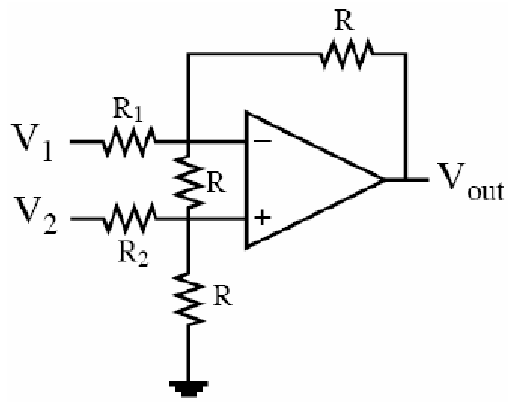
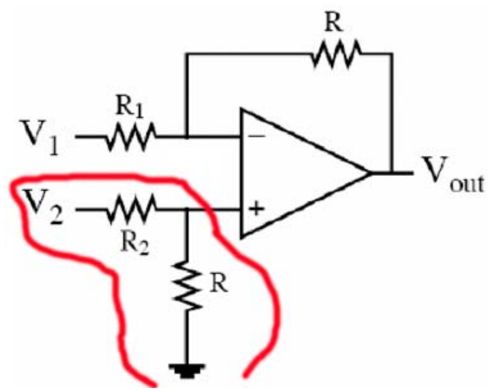


If the op amp is operating correctly, then V+ = V-. There is no potential difference between the two sides of the resistor that V+ and V- . Therefore, no current flows, and we can redraw the circuit as shown below.



First consider only the part of the circuit circled in red. We can write two equations:

$V_2 – R_2I = V_+$ Equation 1
$V_+ - RI = 0$ Equation 2

In these equations, there is only one current, I, because the resistors are in series. None of the current run into the opamp because it is ideal, and it therefore has infinite input impedance.

Rewriting Equation 2 to solve for I, we obtain:

$I = V_+ / R$ Equation 3

Substituting Equation 3 into Equation 1 yields:

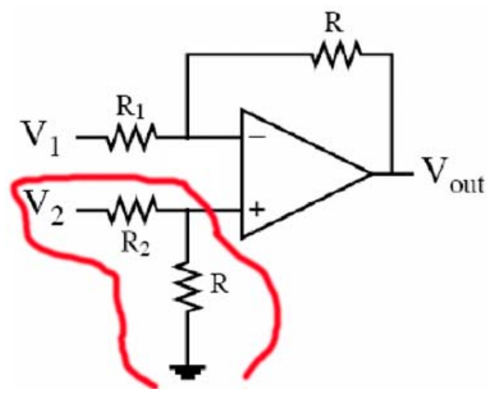
$V_2 – R_2(V_+ / R) = V_+$ Equation 4

Then solve for V_+ as follows:

$V_2 – (R_2/R)V_+ = V_+$
$V_2 = V_+ + (R_2/R)V_+$
$V_2 = V_+(1 + (R_2/R))$

$$V_+ = V_2\left(\frac{R}{R+R_2}\right)$$ Equation 5

Now consider the part of the circuit that is not circled in red.



We can again write two equations.

$V_1 - R_1 I = V_-$ equation 6
$V_- - RI = V_{out}$ equation 7

As before, there is only one current, I, (different from the previous current I), because no current runs into the ideal op-amp.

We now solve equation 6 for I:

$I = (V_1 - V_-) / R_1$ equation 8

And substitute that expression for I into equation 7:

$V_- - R[(V_1 - V_-) / R_1] = V_{out}$ equation 9

Now we want to solve for V_- . First, multiply through by R_1:

$R_1V_- - RV_1 + RV_- = V_{out}R_1$ equation 10

$(R_1 + R)V_- = V_{out}R_1 + RV_1$ equation 11

$$V_- = \left(\frac{V_{out}R_1 + V_1R}{R + R_1}\right)$$ equation 12

Now notice that equation 5 is an equation for V+, and equation 12 is an equation for V-.
But we know that if the op amp is working correctly, then V+ = V-.
So we can equate equation 12 and equation 5:

$$V_- = \left(\frac{V_{out}R_1 + V_1R}{R + R_1}\right) = V_+ = V_2\left(\frac{R}{R + R_2}\right)$$

Solving for V_{out} gives:

$$V_{out} = \left(\frac{R(R_1 + R)V_2}{R_1(R_2 + R)}\right) - \left(\frac{R}{R_1}\right)V_1$$

If $R_2 = R_1$ then $V_{out} = \left(\frac{RV_2}{R_1}\right) - \left(\frac{R}{R_1}\right)V_1$