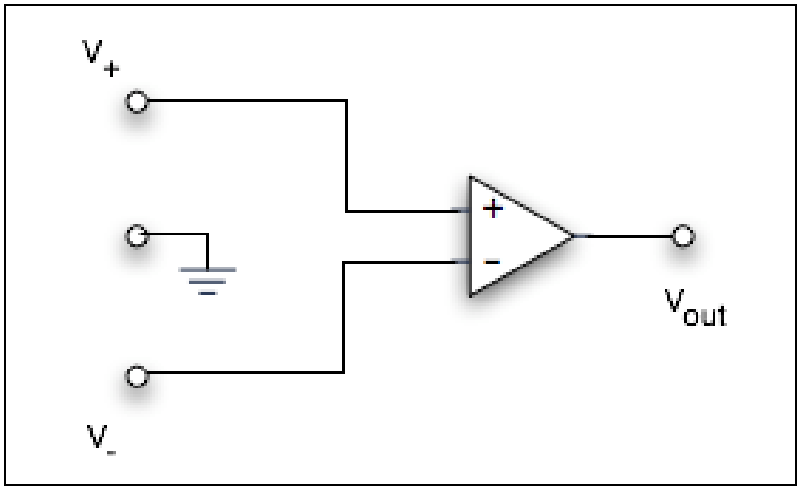
Real operational amplifiers produce an output voltage even when the input voltages are equal (c.f. Diefenderfer and Holton Sec. 9.10) The output voltage in the open-loop configuration shown below may be described in terms of the equation:

$$V_{out} = A(V_+ - V_-) + \frac{A}{CMRR}(V_+ + V_-)$$



CMRR is the Common Mode Rejection Ratio. Given CMR = $20\log_{10}$(CMRR) = 90 dB and open-loop gain of A = $2x10^5$ for the 741 op-amp (Diefenderfer and Holton p. D-70), find V_{out} for the differential amplifier shown if V_1 = 9V, V_2 = 9.02 V, R = 1kΩ and R_F = 120 kΩ. How is V_out different from the output for an ideal operational amplifier?