

Answer on Question #55076, Physics Electric Circuits

a) Design a circuit using op-amp to give +12V at output when input signal is less than -4V and -12V when it is more than -4V.

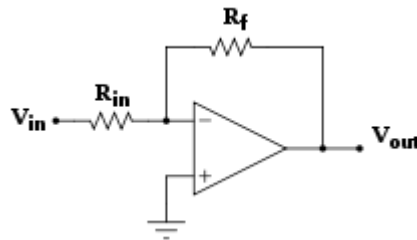


Fig.1

Solution

An inverting amplifier is a special case of the differential amplifier in which that circuit's non-inverting input V_2 is grounded, and inverting input V_1 is identified with V_{in} above. The closed-loop gain is R_f / R_{in} , hence

$$V_{out} = -\frac{R_f}{R_{in}} V_{in} \quad (1)$$

Then

$$R_f / R_{in} = -V_{out} / V_{in} = -(+12) / (-4) = 3$$

Answer: $R_f / R_{in} = 3$