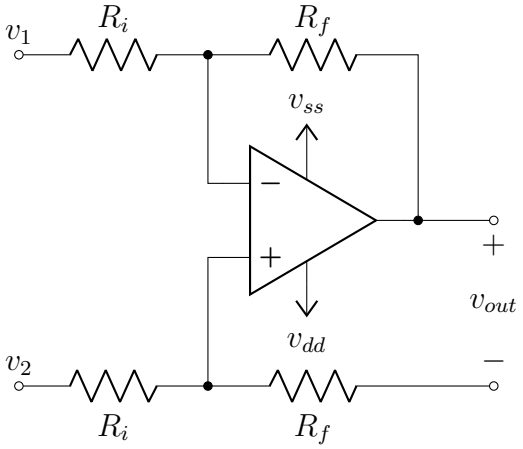
Chapter 1

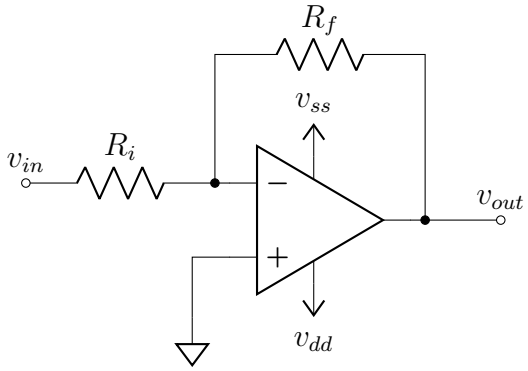
Op-Amplifier Arrangements

1.1 Differential Amplifier



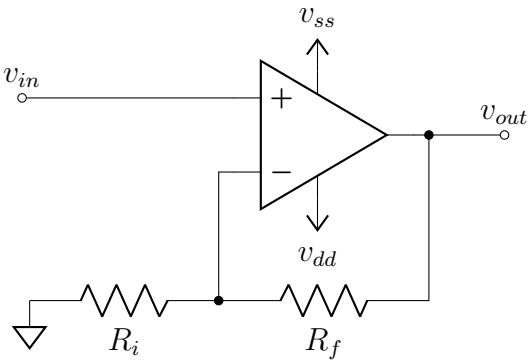
$$v_{out} = \frac{R_f}{R_i}(v_2 - v_1)$$

1.2 Inverting Amplifier



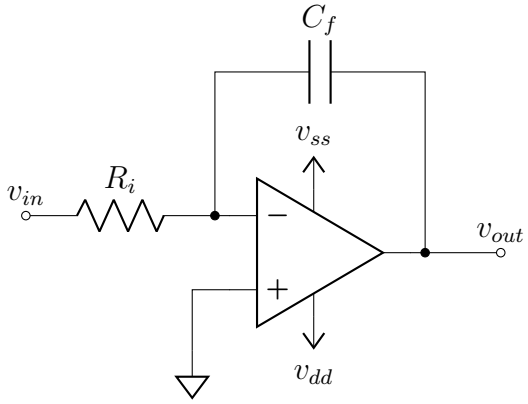
$$v_{out} = -\frac{R_f}{R_i} v_{in}$$

1.3 Non-Inverting Amplifier



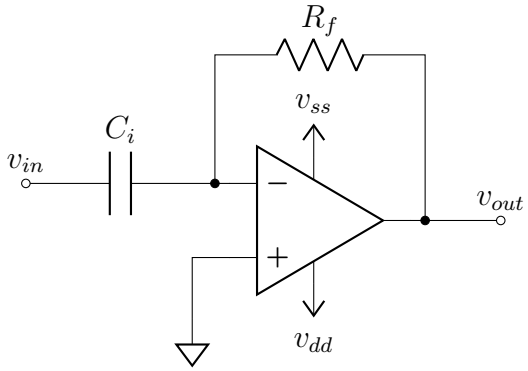
$$v_{out} = \left(1 + \frac{R_f}{R_i}\right) v_{in}$$

1.4 Integrating Amplifier



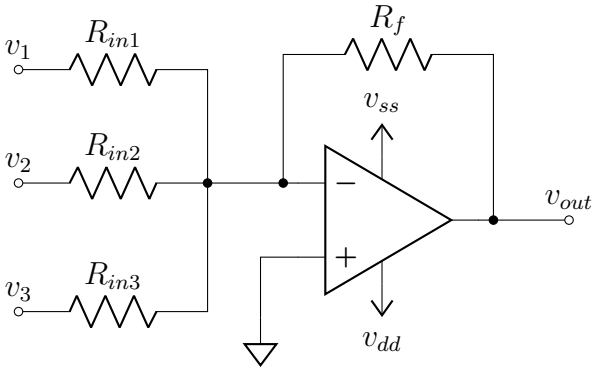
$$\frac{d}{dt}[v_{out}] = -\left(\frac{1}{R_i C_f}\right) v_{in}$$

1.5 Differentiating Amplifier



$$v_{out} = -R_f C_i \frac{d}{dt}[v_{in}]$$

1.6 Summing Amplifier



$$v_{out} = -R_f \left[\frac{v_1}{R_{in1}} + \frac{v_2}{R_{in2}} + \frac{v_3}{R_{in3}} \right]$$