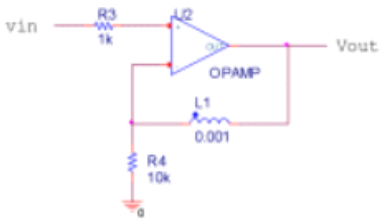
Joseph DeGaetano, Mikaela Gray, Dante Wright, Saaif Ahmed



(You can assume that the power supply has infinite voltage.)

Determine the transfer function, H(s) = Vout(s)/Vin(s) = N(s)/D(s), where N(s) and D(s) are polynomials. (3 pts)

Non Inverting terminal = Vin (no drop across resistor)

Ideal op amp: Non-Inverting = Inverting = Vin

KCL at Inverting Terminal in S domain:

$$\frac{V_{in}}{10k} + \frac{V_{in} - V_{out}}{0.001s} = 0$$

$$\frac{V_{in}}{10k} + \frac{V_{in}}{0.001s} - \frac{V_{out}}{0.001s} = 0$$

$$V_{in}\left(\frac{1}{10k} + \frac{1}{0.001s}\right) = \frac{V_{out}}{0.001s}$$

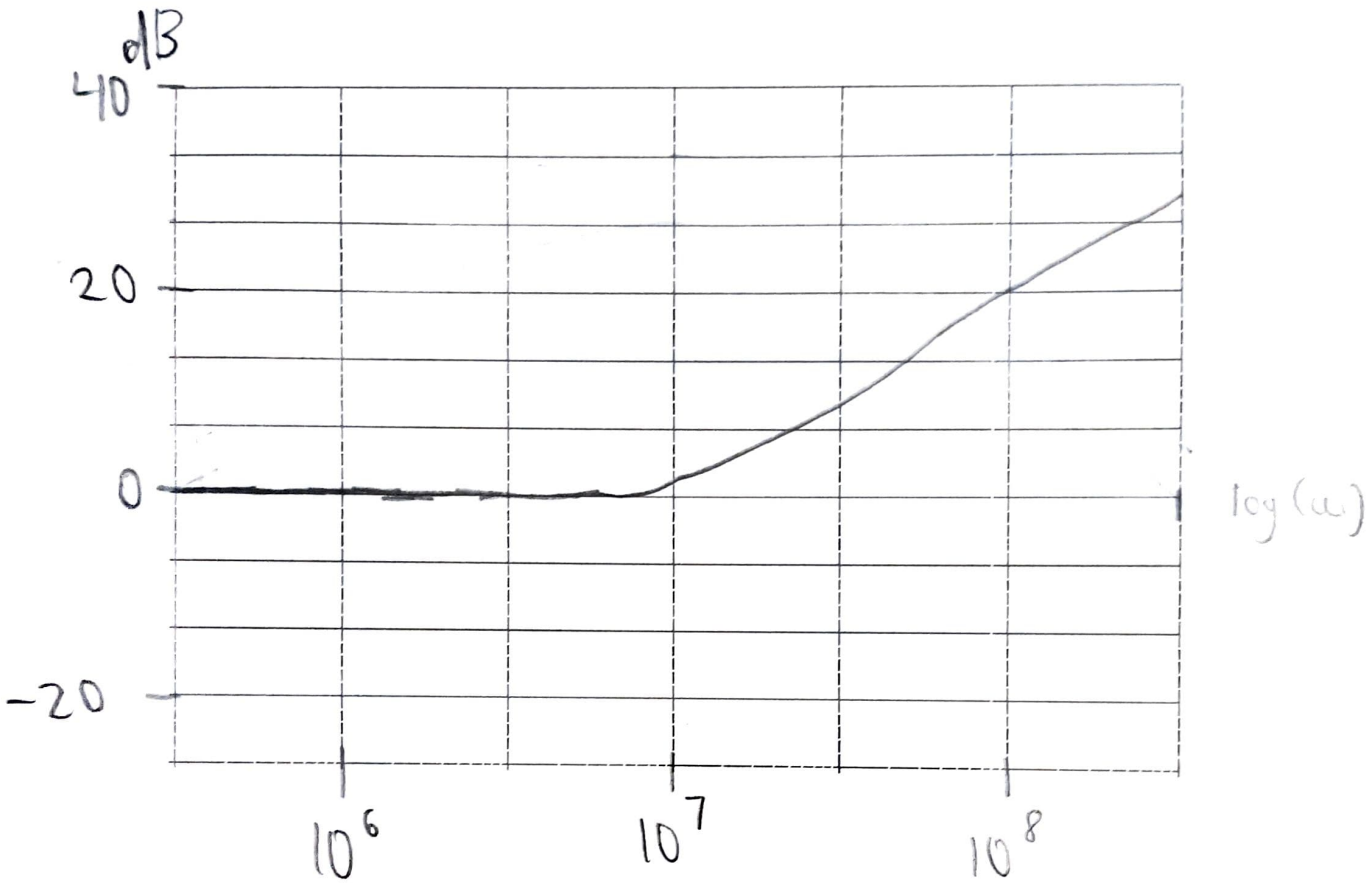
$$\frac{V_{out}}{V_{in}} = H(s) = \frac{s + 10^7}{10^7}$$

In the limit as s → 0, what common type of amplifier circuit does this circuit become? (2 pts)

As $s \to 0 : H(0) = 1$. It becomes a voltage follower.

In the limit as s → ∞, what common type of amplifier circuit does this circuit become? (2 pts)

As $s \to \infty : H(\infty) = arbitrary\ gain$. It becomes a non-inverting amplifier.


dB
40
20
0
-20
10^6
10^7
10^8
log (ω)