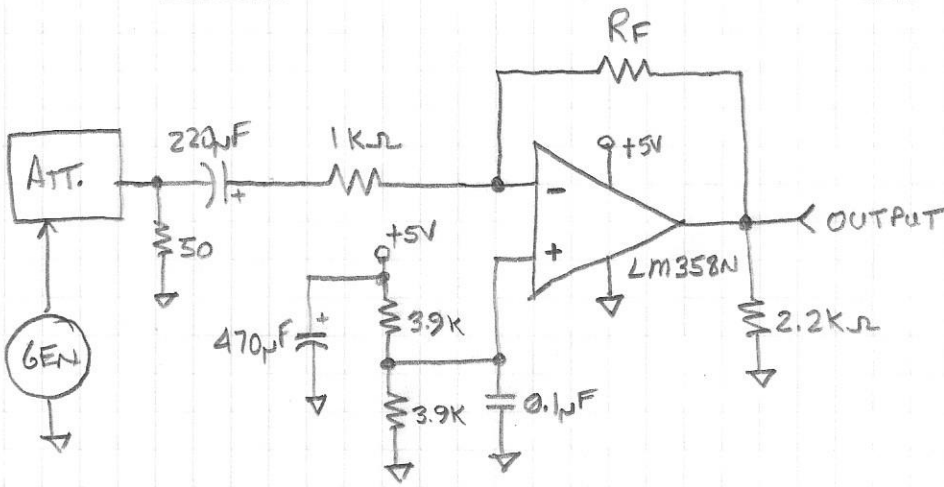


BASICS OF OP AMP

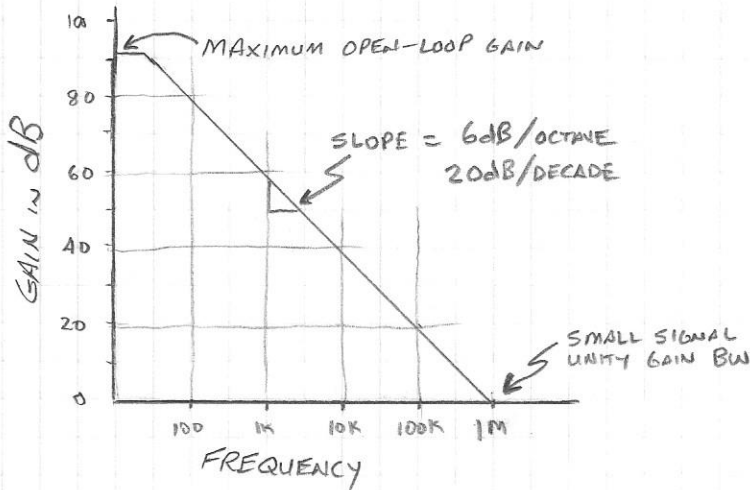
GAIN · BW PRODUCT & SLEW RATE



R_F	A_V	dB
1K	-1x	0dB
10K	-10x	20dB
100K	-100x	40dB

TEST CIRCUIT ↗

- MOST OP AMPS ARE INTERNALLY COMPENSATED WITH A SINGLE DOMINANT POLE.



GAIN - BANDWIDTH PRODUCT = GBP

- PRODUCT OF ANY CLOSED LOOP GAIN & THE RESULTING BW IS CONSTANT

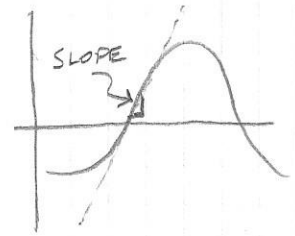
$$GBP = A_V \cdot BW$$

- CAN PREDICT THE BW FOR A DESIRED GAIN

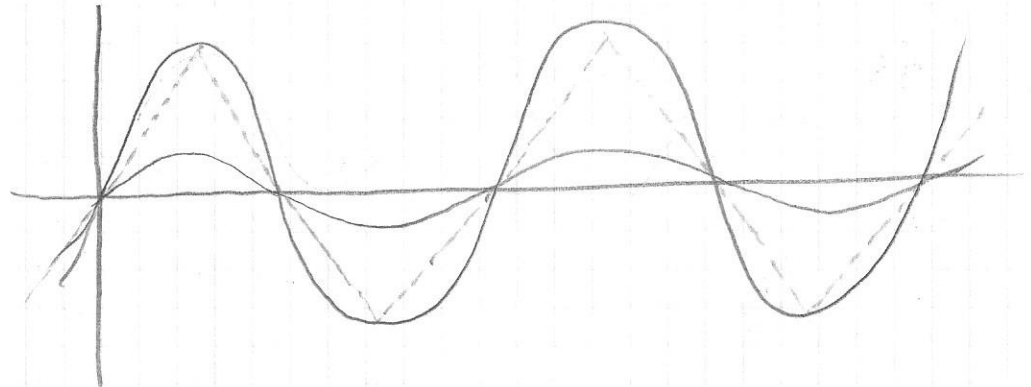
$$BW = \frac{GBP}{A_V}$$

OP AMP SLEW RATE

- MAXIMUM RATE OF WHICH THE OP AMP CAN MOVE THE OUTPUT VOLTAGE
- MOST OFTEN LIMITED BY THE COMPENSATION CAPACITOR & AVAILABLE CURRENT TO DRIVE IT
- PROBLEM FOR "LARGE" SIGNALS
- WILL OFTEN BE THE BW LIMITING FACTOR
- AS SIGNALS GET LARGER, SLOPE GETS STEEPER
- NEED FASTER SLEW RATE CAPABILITY



⇒ (FOR INTERNALLY COMPENSATED OP AMPS)



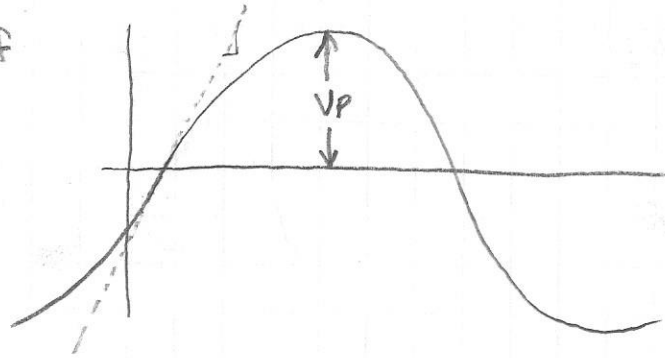
As signal amplitude increases, the required slew rate also increases.

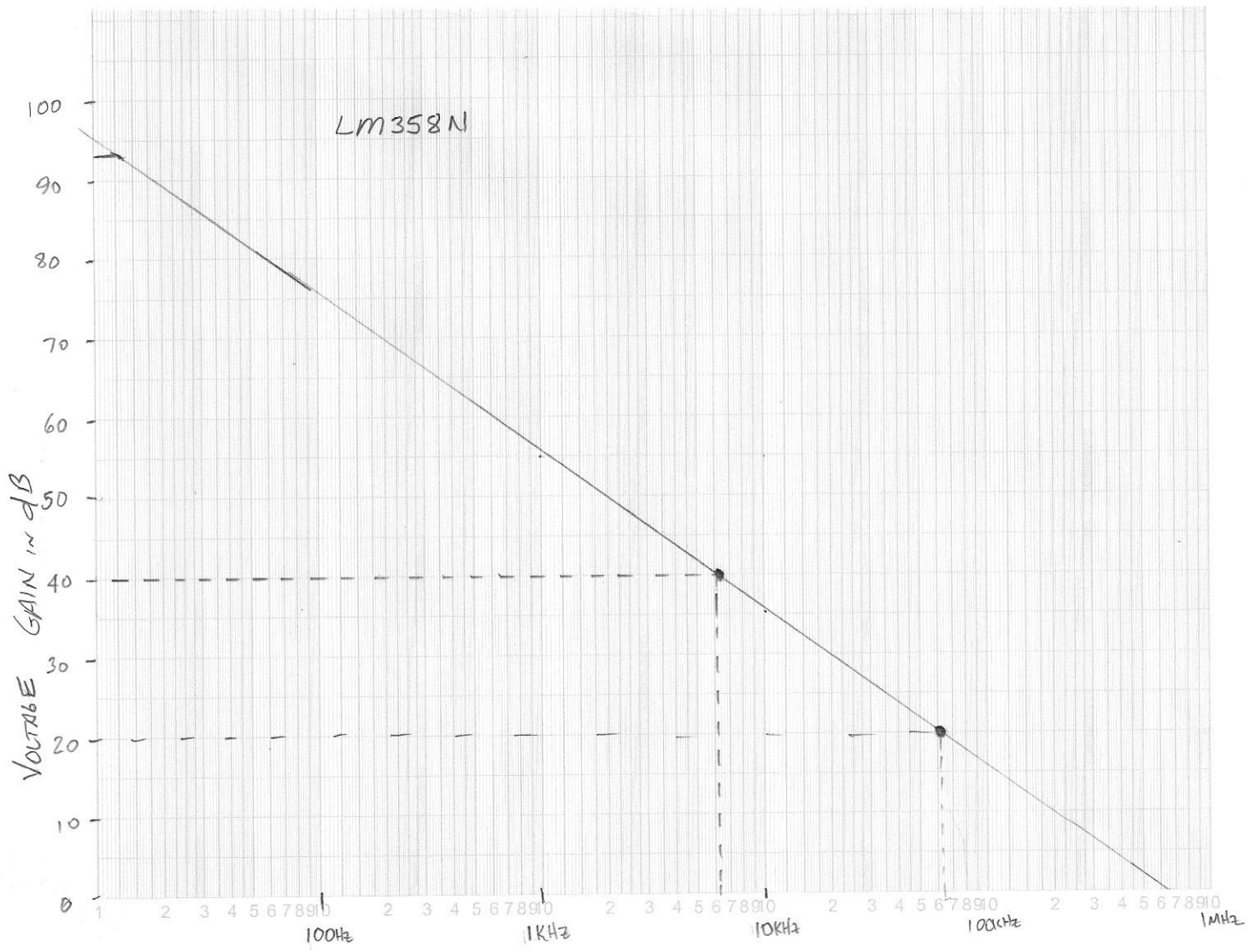
SLEW RATE IS SPECIFIED IN $V/\mu S$

FOR THIS LM358N \rightarrow $0.2V/\mu S$

SLEW RATE OF A SINEWAVE

$$SR_{SINE} = V_p \cdot 2\pi \cdot f$$





Electronics Dept. VIT Vellore Institute of Technology Vellore