RF Design - IP3

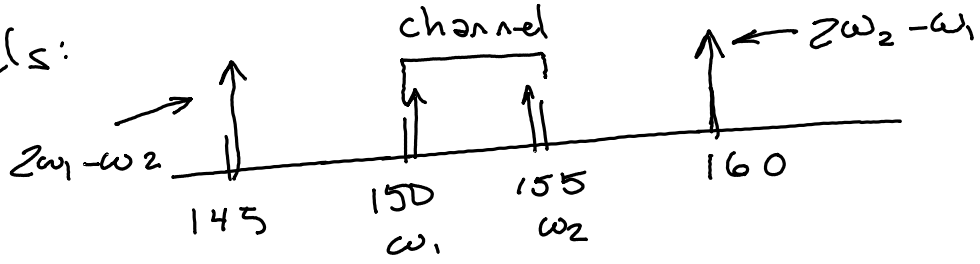
Exercise 1: If the two input frequencies are 150 and 155 MHZ, what are the frequencies of the third-order products? If these two frequencies represent the lower and upper frequencies of a channel, what is the channel bandwidth? Where would the third-order products fall relative to the adjacent channel?

$2\omega_1 - \omega_2 = 2 \cdot 150 - 155 = 300 - 155 = 145$

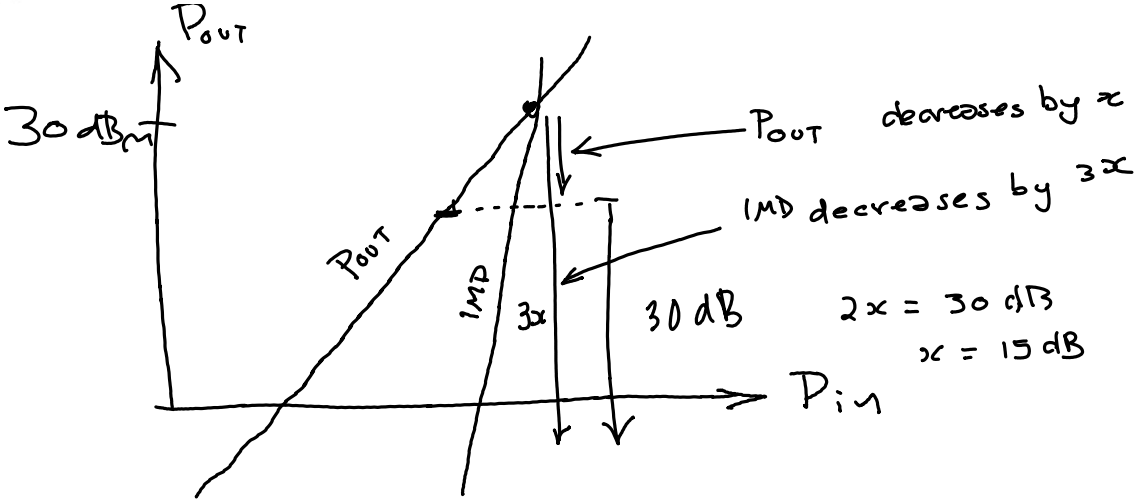
$2\omega_2 - \omega_1 = 2 \cdot 155 - 150 = 310 - 150 = 160$

bandwidth = $155 - 150 = 5$ MHz

145 & 160 are at edge of adjacent channels:



Exercise 2: An amplifier has an OIP3 of 30dBm. If it is required that the adjacent channel power be 30dB below the in-channel power, what is the maximum output power we should try to get from this amplifier?



$P_{OUT} = 30 - 15 = 15$ dBm

IMD decreases by $3 \times 15 = 45$ dB

to $30 - 45 = -15$ dBm