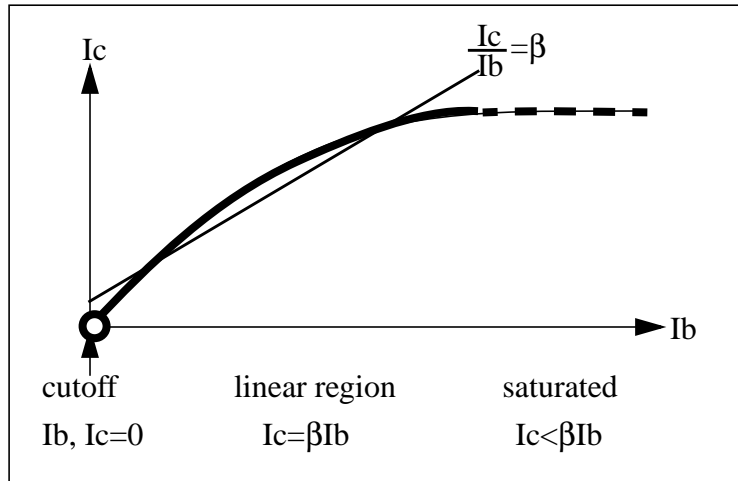


Another way to think about the different regions of operation is to consider the how collector and base currents are related. In the graph below, we see that at cutoff,  $I_b$  and  $I_c$  are equal and are zero. In the linear region,  $I_c = \beta I_b$ . In the saturated region  $I_b$  and  $I_c$  are not zero but further increases in  $I_b$  barely increase  $I_c$  at all.



When we use a BJT as a saturated switch, we usually supply base current well in excess of what is needed to keep the transistor in saturation.