

(a) For $H_A: \mu > \mu_0$

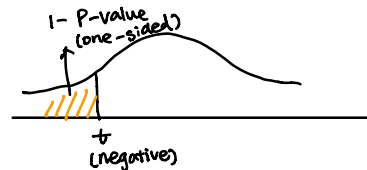
Given a normal distribution, $P_{\text{two-sided}} = P(>t) + P(<-t)$ (t is positive)

P-value is the probability of a true null. Therefore, it represents the area to the right of the normal distribution. Because of symmetry of a normal distribution, we have the following

i $P(>t) = 0.5 * P_{\text{two-sided}}$

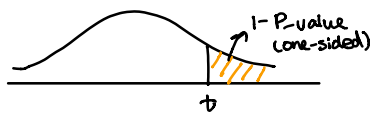


ii $P(<-t) = 1 - 0.5 * P_{\text{two-sided}}$



(b) For $H_A: \mu < \mu_0$, P-value is still defined as the probability of a true null but it represents the area to the left of the t statistic. Similarly, we have the following

i $P(>t) = 1 - 0.5 * P_{\text{two-sided}}$



ii $P(<t) = 0.5 * P_{\text{two-sided}}$

