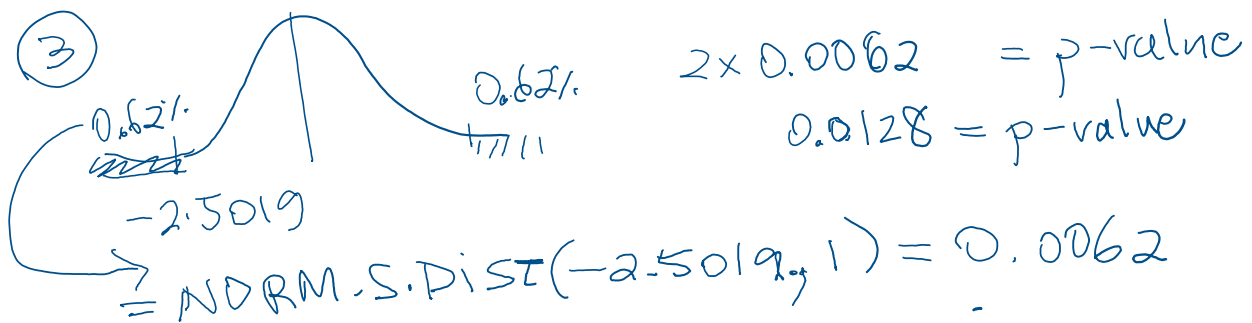


### Example 61.3

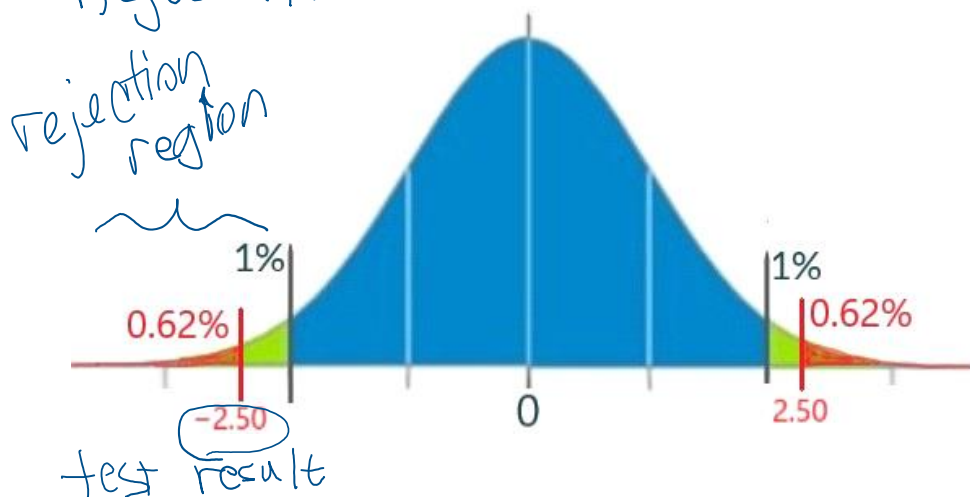
**Problem Setup:** The BC Government is conducting a survey on people's sentiments toward the natural gas pipeline being built. They have sampled two different groups, NDP and Liberal supporters. Out of 224 NDP supporters sampled, 98 were in favor of the LNG pipeline. Out of 206 Liberal supporters sampled, 112 were in favor of the LNG pipeline. Is there sufficient evidence, at the 2% level of significance, to conclude that there is a difference in the proportions of people who support the pipeline?

$$\begin{aligned} \textcircled{1} \quad H_0: p_1 - p_2 = 0 & \quad \begin{matrix} x_1 = 98 \\ n_1 = 224 \end{matrix} \left. \vphantom{\begin{matrix} x_1 = 98 \\ n_1 = 224 \end{matrix}} \right\} \bar{p}_1 = \frac{98}{224} = 0.4375 \\ H_A: p_1 - p_2 \neq 0 & \quad \begin{matrix} x_2 = 112 \\ n_2 = 206 \end{matrix} \left. \vphantom{\begin{matrix} x_2 = 112 \\ n_2 = 206 \end{matrix}} \right\} \bar{p}_2 = \frac{112}{206} = 0.5583 \end{aligned} \quad \left. \vphantom{\begin{matrix} \bar{p}_1 = 0.4375 \\ \bar{p}_2 = 0.5583 \end{matrix}} \right\} \bar{p} = \frac{98 + 112}{224 + 206} = 0.49535$$

$$\textcircled{2} \quad z_{\text{test}} = \frac{\bar{p}_1 - \bar{p}_2}{\sqrt{\bar{p}(1-\bar{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} = \frac{0.4375 - 0.5583}{\sqrt{0.49535(1-0.49535)\left(\frac{1}{224} + \frac{1}{206}\right)}} = \frac{-0.1208}{0.048265} = -2.5019$$



$\textcircled{4}$  Decision:  $p\text{-value} = 1.28\% < 2\%$  level of significance  
Reject  $H_0$ .



$\textcircled{5}$  Conclusion: There is enough evidence to conclude that there is a difference between the two groups.