Activity 6: Hypothesis Testing for a Proportion
STAT 310, Spring 2023

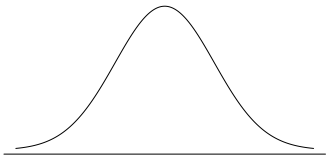
Exercise 1. It is believed that nearsightedness affects about 8% of all children. In a random sample of 194 children, 21 are nearsighted. Conduct a hypothesis test for the following question: do these data provide evidence that the 8% value is inaccurate?

(a) Write the null and alternative hypothesis for a two-sided test.

(b) Check the conditions for the hypothesis test.

(c) Calculate the test statistic.

(d) Calculate the p-value and make a decision using $\alpha = 0.05$ significance level.

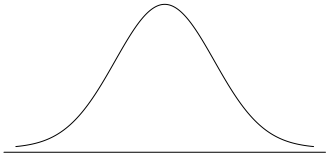


(e) What is the conclusion of the test in the context of the data?

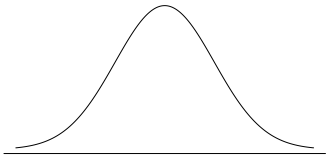
(f) What type of testing error might we have made?

Exercise 2. Find the p-value for the given z-test statistic for a hypothesis test for a proportion. Also determine if the null hypothesis would be rejected at $\alpha = 0.05$ significance level. Assume all the conditions for the hypothesis test are satisfied.

(a) $H_A : p < p_0$; $z = -1.25$



(b) $H_A : p > p_0$; $z = 2.5$



(c) $H_A : p \neq p_0$; $z = -3$