

MAT 223, Discussion Questions 11.25

1. What conditions must hold for using a z-test for proportions in a hypothesis test?

both $np > 5$
 $n(1-p) > 5$

2. A city ordinance requires that more than 75% of its residents must agree to the construction of new public buildings (using tax dollars) before any such structures can be built. A proposal has been made to build a new recreational facility in the city, and sponsors of the proposal want to conduct a small survey to see if it would be approved if put to an official vote of all residents. A simple random sample of 150 residents revealed that 123 supported a change (and 27 did not).

$H_0: p = .75$
 $H_a: p > .75$
 1 Prop z Test
 $p_0 = .75$
 $X = 123$
 $n = 150$
 prop $> p_0$

$z = 1.979...$
 $p = .0238... < .05$

reject H_0
 This is good evidence that the measure would pass in an election

3. Scientists think that robots will play a crucial role in factories in the next several decades. Suppose that in an experiment to determine whether the use of robots to weave computer cables is feasible, a robot was used to assemble 500 cables. The cables were examined and there were 15 defectives. If human assemblers have a defect rate of 0.035, does this data support the hypothesis that the proportion of defectives is lower for robots than for humans? Use a 0.01 significance level.

$H_0: p = .035$
 $H_a: p < .035$
 1 Prop z Test
 $p_0 = .035$
 $X = 15$
 $n = 500$
 prop $< p_0$

$z = -1.608..$
 $p = .27.. > .01$ fail to reject H_0
 This is not good evidence to think robots are better than humans at this task

4. Comment on the article at <http://news.stanford.edu/news/2015/january/math-learning-boaler-012915.html>.