

Fall 2009 Stat 135 Midterm #1 Solutions

Problem #	Version A	Version B
1	False	False
2	True	False
3	False	False
4	False	True
5	True	True
6	False	True
7	A	B
8	C – population size doesn't affect the MOE as long as the sample size is a small fraction of it.	
9	a) C b) A c) B	a) B b) A c) C
10	Not very reliable – Reason 1; Valid – reason 3; Biased – Reason 2	
11	The median number of cups consumed was about half the mean number. The distribution is heavily skewed to the right so the median would be less than the mean. (Some partial credit was given for students misinterpreting the first bar of the histogram as only including people who drank zero cups of coffee if their reason fully supported their conclusions)	
12	a) $100\%(141/1122) = 12.57\%$ b) $100\%(98/516) = 18.99\%$ c) $100\%(98/141) = 69.50\%$ d) Random selection helps to eliminate bias and thus make the sidewalks studied representative of all sidewalks in St. Louis. It does not affect non-sampling errors or necessarily reduce variability (it is what underlies sampling variability).	
13	a) randomized double blind experiment – The researchers deciding on whether the subjects gained immunity did not know which group they were in and the subjects couldn't tell which group they were in since a salt solution shot could not be distinguished from a true vaccine shot. b) i) The word “significant” meant that the differences between groups in immunity were unlikely to have happened by chance while the “not significant” differences in side effects could be explained by chance. ii) It was important to have a control group for comparison in case some subjects already had immunities to the H1N1 flu and it was important for this to be a placebo so differences between groups would not just be explained by a reaction to the idea of being treated.	
14	a) 95% by 68-95-99.7 rule since the problem is asking about being within 2 standard deviations. b) $z = (16.4-16)/0.25 = 1.6$ then from the tables, the answer is $100\% - 94.52\% = 5.48\%$ (note – more partial credit given for errors when an appropriate picture accompanied the answer)	a) 68% by 68-95-99.7 rule since the problem is asking about being within 1 standard deviation. b) $z = (16.3-16)/0.25 = 1.2$ then from the tables, the answer is $100\% - 88.49\% = 11.51\%$ (note – more partial credit given for errors when an appropriate picture accompanied the answer)

15	<p>Population: Adult Americans Parameter: % of Adult Americans who feel research on stem cells from human embryos is morally acceptable Sample: The 1015 people surveyed Statistic: 57%</p> <p>The MOE for the Republicans and Democrats separately would be larger than 3% because the sample size would be smaller</p>
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