

Quiz 5 (Individual) for Statistics 113
Statistics and Society–Fall 2001
Material Covered: Chapters 19,20 of Workbook and text
Friday, 2nd November

Name (please print): _____
last first

The town of St Joseph, Michigan, has 15,000 residents, of whom 10,000 are licensed drivers. The transport department takes a simple random sample of 400 residents from this town and finds 300 of them are licensed drivers (let LD stand for “licensed driver”).

- (a) [1 point] Match statistical terms with LD example.

terms	LD example
(i) population	(i) LD or not, 500 St Joseph residents
(ii) sample	(ii) LD or not, all St Joseph residents
(iii) statistic	(iii) percentage LD, all St Joseph residents
(iv) parameter	(iv) percentage LD, 500 St Joseph residents

terms	(i)	(ii)	(iii)	(iv)
LD example				

- (b) [1 point] Recall that the chance error is the difference between the observed number of LDs and the expected number of LDs; in this case, the chance error is (circle closest one) **-13** / **-23** / **-33** / **-43** / **-53**.
- (c) [1 point] The standard error in the percentage of licensed drivers is (circle closest one) **1.8%** / **2.3%** / **3.3%** / **3.7%** / **4.1%**.
- (d) [1 point] The chance that there are 75% or more licensed drivers, in the 400 sampled from St Joseph, is (circle closest one) **0.002%** / **0.02%** / **0.2%** / **2%** / **4%**.
- (e) [1 point] Instead of a sample 400 residents, a larger sample of 700 residents is taken. The standard error in the percentage of licensed drivers decreases by a factor of (circle closest one) **1.1** / **1.3** / **1.5** / **1.7** / **1.9**.

(a) (ii), (i), (iv), (iii)

(b) **-33**

$$\text{ave box } \frac{10000(1)+5000(1)}{15000} = 0.67$$

$$\text{expected sum } 400 \times 0.67 = 267$$

$$\text{observed sum } 300$$

$$\text{so chance error is } 267 - 300 = -33$$

(c) **2.3%**

$$\text{SD box } (1 - 0) \sqrt{\frac{10000}{15000} \times \frac{5000}{10000}} \approx 0.471$$

$$\text{SE } \sqrt{400} \times 0.471 = 9.43$$

$$\text{SE}\% \ 9.43/400 = 0.0236$$

(d) **0.02%**

$$(0.75 - 10/15)/0.0236 \approx 3.53$$

use tables to calculate area of one half of (100 - 99.96)%

(e) **1.3**

$$\sqrt{700/400} \approx 1.3$$

in other words, SE% of 0.024 decreases to $0.024/1.3 \approx 0.018$