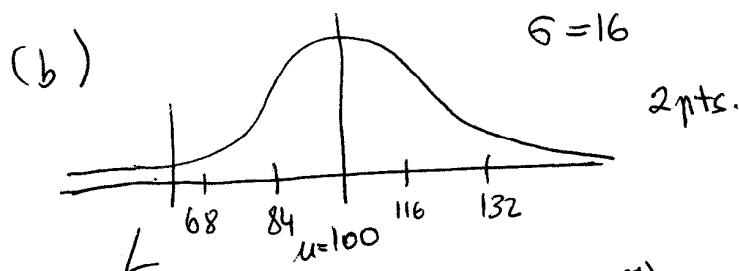


TEST 2 Solutions

-1-

[32]

- [12] 1. (a) 84% (2 pts)
97.5% (2 pts)



Find L so that $P(X > L) = .98$. Looking up .98 in the table the closest we get is $z = 2.06$ for which the area to the left is .9803. This means that L has a z score of -2.06 so $L = 100 - 2.06 \times 16 = 67.2$.
or -2.05 and then $L = 67.2$.

[8] 2. see solution to group work (a) \neq symm, higher median, smaller IQR, P right skewed, larger spread, smaller n
(b) 2.5% [2 pts.]

[12 pts] 3. (a) $P(H) = P(T) = \frac{1}{2}$

a sequence of HTHHTH has probability of $(\frac{1}{2})^6$ and [3 pts] all the other sequences have the exact same probability to occur.

[3 pts] (b) In HTHHTH we have 3 Heads and 3 Tails while in HHHHHT we have 5 Heads and only 1 Tail. Some people believe in the Law of Small Numbers and think that on 6 tosses even you should get close to an equal number of Heads and Tails.

[3 pts] (c) Long term relative frequency for an event must approach the probability of the event. (see your no)

[3 pts] (d) In the LLN we talked about a great number of observations before the relative frequency would get close to the probability. Well, six is NOT a large number by any standards. (except when you have that many kids.)

(10 pts) 4. (a) undercoverage (not everybody leaves between 5:00 and 5:30 pm)

[6]

and nonresponse (people have to pick up children do stopping after work not a good time for survey)

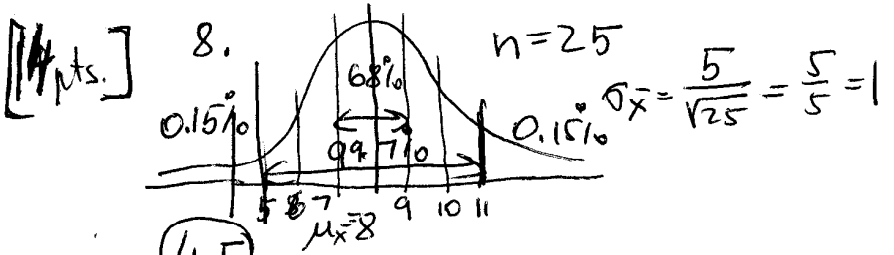
[4] (b) yes

[14 pts] 5. (see group work solutions on website) CONDITIONS [1] n, p [2] [3] $\sigma p = 0.012$ z score ≈ 8 [3]

[10 pts] 6. $P(\text{stat} \geq \text{history}) = 0.5 \cdot 0.6 = 0.3$ 30%
[5] assuming independence

[5] $P(\text{at least one A}) = 1 - P(\text{no A's}) = 1 - (0.5 \times 0.4) = 1 - 0.2 = 0.8$ 80%

[10 pts] 7. observation 1.5
10 times 11.5
1.5 pts each
except second
closer 1 pt
LLN 4.5
closer (1.5)
closer (1.5)
10 (1.5)



Central Limit Thm [1]
normal curve [2]
mean 8 [2]
st. dev. $5/\sqrt{25} = 1$ [2]

(4.5) in this distribution is very far from the mean more than $3\sigma_{\bar{x}}$ away.

68% chance ... 7 and 9
99.7% ... 5 and 11

Therefore chances for 25 people losing on average of 4.5 lbs is very unlikely chances are smaller than 0.15% for that to happen. [4]

[10 pts] 9. (a) B = man takes you to see Fosse on Broadway
(b) B = you eat a Banana