

Cumulative AP practice Test 1

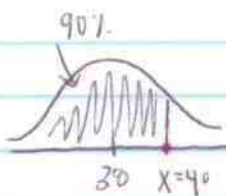
Answer key

MULTIPLE CHOICE

1. d

2. e

$N(38, \sigma)$



use $\text{invNorm}(.90) = 1.28 = z$

$$z = \frac{x - \mu}{\sigma} \quad 1.28 = \frac{40 - 38}{\sigma} \quad \sigma = 1.56$$

3. b

$$\text{mean} = 2(60) - 5 = 115$$

$$\text{std. dev} = 2(18) = 36$$

4. c

5. a

6. c

7. e

8. e

9. d

10. d

11. d

12. b

$$y = 22.6 - 1.6x$$

13. b

14. a

FREE RESPONSE

15 a) Remember "SOCS" and use comparative words.

The distribution of Machine A is more symmetric - Machine B is slightly skewed to the left. There are no outliers in either distribution. The median of Machine B is higher than that of Machine A. Machine B is more spread out than Machine A.

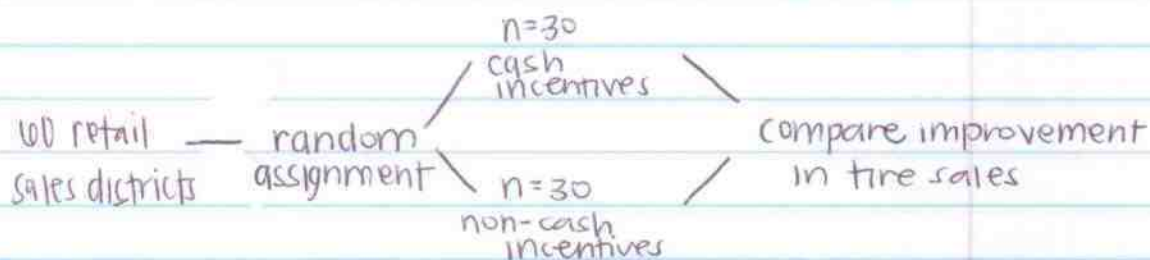
b) They should use Machine B because they could say there were gains of up to 59, whereas with Machine A, they could only claim gains of up to 46.

c) They should use Machine A. There is less spread in the distribution of Machine A.

d) This question is asking you why the company can't really generalize their findings in this particular study to the whole population. One big reason is that the subjects are volunteers who were probably already using the fitness center regularly - they may not be a good representation of the general public.

FREE RESPONSE

16 a)



To do the random assignment, give each retail sales district a number between 1 and 60 and put them in a hat. The first 30 you pull out will be given cash incentives for improving their tire sales and the remaining 30 will be given non-cash incentives. Control other possible confounding variables like the amount of sales they were making before this incentive program.

b) choose 30 different 2 digit numbers (ignoring any outside the range of 01-60)

07, 51, 18 would be the first three for the cash incentives treatment group.

c) In matched pairs, we pair up the 2 that are most similar. pair the two districts with the highest sales, the next two highest, and so forth. Flip a coin to choose which of the 2 in each pair will be in the cash group and which will be in the non-cash group. After a period of time compare the increase in tire sales between the two.

FREE RESPONSE

- 17 a) There is a strong, positive, linear correlation between shelf length and sales, with no distinct outliers
- b) $\widehat{\text{sales}} = 317.94 + 152.68(\text{shelf length})$
↑
You have to put the "hat"
or say "predicted"
- c) $317.94 + 152.68(5) = \$1081.34$
- d) The typical error in predicting sales from shelf length will be about \$22.92.
- e) coefficient of determination = r^2
 $r^2 = .982$ means that about 98.2% of the variation in weekly sales revenue can be explained by a linear relationship with shelf length.
- f) The y-intercept (which is sales of \$318 with 0 shelf length) doesn't make sense in context. It is a case of extrapolation.