## Practice for the Final Exam, Math 125

(final given out on December 17; return by 6 pm December 18)

Math 125 Kovitz Fall 2020

## True or false.

On the final show your work and write out the whole word: true or false.

Each correct answer is worth 5 points.

For each incorrect answer, 2 points are deducted unless partially correct work is shown.

- 1. If 60% of the owner-occupied housing units in a survey had between 6 and 9 rooms inclusive, the height of a block for 6 to 9 rooms in a histogram for owner-occupied housing units should be 20% per room.
- 2. Both of the lists 2,8,10,11,14 and 3,7,9,11,15 have averages of 9 and SDs of 4.
- 3. In a data set for which the SD is equal to 8, a member of that set which is 3.7 SD below average is -3.7 in standard units.
- 4. If the heights of a large group of women follow the normal curve, a woman who was at the 38th percentile in height should be 0.30 SDs below average in height.
- 5. If men always married women who were exactly 11% shorter, the correlation between their height would be 0.89.
- 6. The correlation coefficient, r, for the data set

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- 7. Since there is a negative correlation between hours spent watching television and scores on reading tests, watching television makes people less able to read.
- 8. If, for a large group of men, the correlation between height and weight is 0.40, for the men whose heights were 2 SDs above average, the regression line estimates their average weight to be 0.8 SDs above average.
- 9. For men with avg. height 68 inches, SD height 3.7 inches, avg. weight 177 pounds, SD weight 29 pounds, and r = 0.724, the r.m.s. error of the regression line predicting weight from height is about 20 pounds.
- 10. For a group of men with average height of 67 inches, SD of 4 inches, average weight of 152 pounds, SD of 32 pounds, and r = 0.75, the regression line is weight =  $6 \times \text{height} 250$  pounds.

11. When a player is dealt a blackjack hand of two cards, the chance that both cards are picture cards is  $(12/52) \times (11/51) = 11/221$ . (Dealt without replacement.)

(The picture cards in a standard deck are the jacks, queens, and kings.)

12. When a fair coin is tossed three times, the probability that either the first two tosses are heads or the last two tosses are tails or both comes out to (1/4) + (1/4) = 1/2, by the addition rule.

(The question is asking for the chance that at least one of the following two things happens: the first two tosses are heads or the last two tosses are tails.)

- 13. When a fair coin is tossed eight times, the chances of getting at least 4 heads is not 1/2, but 163/256.
- 14. When a fair coin is tossed a large number of times, the observed number of heads will tend to get closer to the expected number of heads as the number of tosses gets larger.
- 15. When 64 draws are made at random with replacement from the box  $\begin{vmatrix} 4 & 6 & 8 \\ 10 & 12 & 14 \\ \end{vmatrix}$

the chance that the sum of the draws will be between 592 and 688 is about 87%.

16. When 162 draws are made at random with replacement from the box  $\begin{bmatrix} 0 & 0 \end{bmatrix} \begin{bmatrix} 1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 1 \end{bmatrix} \begin{bmatrix} 1 \end{bmatrix} \begin{bmatrix}$ 

the expected number of 1 is is 108 and the SE is 6.

- 17. When a fair coin is tossed 1681 times, the probability of getting exactly 841 heads is 4%, to the nearest one percent.
- 18. When, in a city with 500,000 residents 361,500 of whom are Democrats, a simple random sample of 2,000 residents is drawn, the percentage of Democrats in the sample will be around 72.3%, give or take 1%.
- 19. If 1839 persons in a simple random sample of 4000 people in a large population were Protestants, a 95%-confidence interval for the percentage of Protestants in the whole population is 45.2% to 46.8%.
- 20. When 400 draws are made at random with replacement from a box of tickets with an average of 100 and an SD of 20, the chance that the average of the draws will be in the range 96 to 104 is 16%.
- 21. When a coin is tossed 6,400 times and it lands heads 3,304 times, there are too many heads to conclude that the chance of heads equals 50%.
- 22. A die that was rolled 60 times and produced fequencies for one to six spots of 3, 8, 14, 15, 11, and 9 appears to be a fair die.