AP Statistics Answer to Ch. 4 Review

1. d 2. e 3. c 4. b 5. d 6. b 7. e 8. d 9. b 10. e 11. ~~a~~ c 12. c ~~13. e~~ 14. d

15. b 16. b 17. d 18. e 19. e

20.)a. A matched pairs design is used in which each subject receives a pair of boots where one boot is treated with the new method and the other with the current method. Subjects are randomly assigned to one of two groups. Group 1 would have the new method applied to the right boot; group 2 would have the new method applied to the left boot OR For each subject, whether the new method is applied to the right or left boot is determined at random (flip a coin).

OR each subject receives a pair of boots, both of which were treated with one treatment. The boots are used for 3 months and then exchanged for a second pair of boots, both of which were treated with the other treatment. These boots are then used for the next three months. Subjects should be randomly assigned to one of two groups. One group receives boots with the new treatment first and the other group receives boots with the current method first.

b. The design could be double blind as long as both the subjects and the person evaluating the boots for water damage do not know which boots are treated with the new method and which were treated with the current method.

21. a. Assign each subject a number from 001 to 300 and then use a random table or random number generator to select 150 of the 300 for the new filter group. The other 150 would be assigned to the standard filter group. OR for each subject, flip a coin. If the coin lands heads, assign the subject to the new filter group; otherwise assign the subject to the standard filter group. Continue in this way until one of the groups has 150 subjects. Assign all remaining subjects to the other group.

b. Without a comparison group, the cholesterol level could change overall, but we would not be able to determine whether the observed change was due to some other extraneous variable that changed during the 10 week period.

For example, diet might change with time of the year, and the diet might result in changes in cholesterol changes. So a change in cholesterol would not be attributable to the new coffee filter. The addition of a control group enables the researchers to assess the mean change in cholesterol level due to the coffee filter, as opposed to just determining if the cholesterol level changed. The control group eliminates the confounding variables of another change that might have occurred over the 10 week period.

c. If it is known that smoking is related to changes in cholesterol level, it would be best to control for smoking by using nonsmokers. This eliminates smoking as a source of variability, creating more homogeneous groups, enabling more direct comparisons between the treatment and control groups and more precise estimates of the treatment effects (though we will only be able to generalize the results to nonsmokers).

22.a. population—Adult (18 or older) residents of US, sample size = 1002

b. Reduce bias, answers to the question may be affected but the order of the responses

23. a. Assign labels 0001 – 3478, pick groups of 4 digits until you get 100 distinct numbers between 0001 – 3478. Match the numbers to a students name.

b. 2940, 0769, 1481, 2975, 1315