

## Stat 2000 International – Midterm - Answers

1. Correct answer: [3] A comparative experiment would provide the better information about the effect of chromium picolinate on elevated cholesterol values, because participants would be assigned to receive a placebo or the chromium picolinate.
2. Correct answer: [2] Stratified random sampling
3. Correct answer: [3] Pet ownership is associated with higher marital satisfaction, however, we can not conclude any causal relationship.
4. Correct answer: [4] drinking status
5. Correct answer: [3] A statistic is different for each sample from a particular population
6. Correct answer: [1] Histogram A
7. Correct answer: [1] Average is larger.
8. Correct answer: [1] Logan has the greater spread
9. Correct answer: [1] There is no consistent pattern.
10. Correct answer: [3] 1.0
11. Correct answer: [2] Plot B [ecological correlation is based on aggregations of observations]
12. Correct answer: [4] 0.04
13. Correct answer: [2] The events "king" and "diamond" are independent but not mutually exclusive
14. Correct answer: [4] 129/235
15. Correct answer: [2] The other will never occur
16. Answer: There is a definite linear trend, with taller people tending to be heavier. There do not appear to be any outliers.
17. Answer: There does not appear to be any trend. There are a few outliers to the right. They are people 25 and over: P74, P93, P96, P105.
18. Answer:  $P(A|B) = 0.375$  when A is a subset of B.

19. Answer: about 67" and 63".

20. Answer: About 215 and 325.

21. Answer: The researcher could randomly assign one-half of a group of volunteers to take Vitamin C and randomly assign the other half to take nothing (or a placebo). After a certain period of time, one year say, the researcher could compare the number of colds each of the two groups had.

22. Answer: The extent to which the sample represents the population of interest depends on what types of students are enrolled in statistics classes that term. Depending on the university requirements and the term in question, there may be more freshman or seniors than in the general student body, and certain majors are likely to be over- or under-represented.

23. Answer:  $50 / (50 + 450) = 10\%$

24. Answer:  $32.7 / 74.8 = 43.7\%$

25. Answer: 1480.71 It is very much larger than the 60.86.

26. Correct answer: [4] 0.18

27. Correct answer: [3] 3/4

28. Correct answer: [2] 0.63

29. Correct answer: [1] \$3

30. Answer:  $50 * 0.23 = 11.5$

31. Answer:  $P(\text{more than } 3) = .60$

32. Answer: mean =  $np = 60 * 2/3 = 40$ ; standard deviation =  $\sqrt{np(1-p)} = \sqrt{60 * 2/3 * 1/3} = 3.651$

33. Answer: expected =  $n * p = 60 * 0.15 = 9$ ;  $P(\text{at most } 5) = 0.0968$

34. Answer: Correlation = 0.8825071; this represents positive association and is very strong

35. Correct Answer: [3] The higher range of temperatures has been observed for July. [This is the statement that is NOT correct: the range in January is 55 and in July only 22]