Economics 215

Quick "diagnostic" quiz – no calculators, please!

1. The mean and variance of the values $\{2, 4, 6\}$ are _____ and _____.
2. The median can be a more meaningful measure than the mean when a distribution is _____.
3. If the variance of a certain random variable is 100 then its standard deviation is _____.
4. If a random variable is distributed normally with mean μ and standard deviation σ then approximately _____ percent of its values lie in the range $\mu \pm 2\sigma$.
5. The chance that a draw from a normal distribution yields a value more than three standard deviations from the mean is roughly _____.
6. If X is a random variable with variance σ_X^2 and a and b are constants, the variance of $a + bX$ is then _____.
7. If X and Y are two random variables with standard deviations σ_X and σ_Y respectively, the variance of $X + Y$ is then _____.
8. On tossing a fair coin 5 times, the probability of getting 5 heads is _____.
9. The more successive times a roulette ball lands on red, the greater the chance that it will land on black next spin: TRUE / FALSE ?
10. The *expected value* of a random variable is the value that is most likely to occur when drawing from its distribution: TRUE / FALSE ?
11. In a statistical test, the P-value is (roughly) the probability that the null hypothesis is true, given the evidence: TRUE / FALSE ?
12. In a statistical test, the P-value is (roughly) the probability of observing the given evidence if the null hypothesis were true: TRUE / FALSE ?
13. If $y = a \log x$ then $dy/dx =$ _____.
14. If X grows exponentially over time then $\log X$ does what over time? _____
15. Let u be a column vector of length n. Then a compact way of writing $\sum_{i=1}^{n} u_i^2$ is _____.
16. If X is a non-zero $T \times k$ matrix, what do we know about the matrix $X^\top X$?
17. How do you solve the matrix equation $AX = B$ for X? (Assume A is $m \times m$, X is $m \times n$ and B is $m \times n$.)
18. What condition is required of A for a solution to exist, in relation to question 17?