1. **A**. Add the numbers up and divide by the number of numbers. The sum is 536 and there are 10 numbers. The solution is the reduced answer.

2. **C**. First find the probability that the student scored greater than 78. $z = \frac{78-72}{6} = 1 \to p = .1586552596$. Then find the probability that the student scored greater than 88. $z = \frac{88-72}{6} = 3 \to p = .0038304251$. The final solution is obtained by dividing the two probabilities. $\frac{.0038304251}{.1586552596} = .0241430704 \approx .0241$.

3. **E**. You are not told specifically in the problem that the sets A and B are independent. Therefore, you can't compute the standard deviation without more information which is not provided.

4. **C**. Multiply each ethnicity percentage by the voters for Scott for that ethnicity and add the results. (.6)(.65)+(.18)(.4)+(.17)(.25)+(.05)(.3) = .5195 or 51.95%.

5. **B**. The resistant measures in statistics are the median and the interquartile range.

6. **D**. This is an example of a stratified sample. The population was broken into grade levels and then an random sample was taken from each grade level.

7. **A**. Given the equation $y - \bar{y} = r\left(\frac{\sigma_y}{\sigma_x}\right)(x - \bar{x})$. Plugging in produces

$$y - 92 = .82\left(\frac{7}{5}\right)(x - 71) \to y - 92 = \frac{287}{250}(x - 71) \to y = \frac{287}{250}x + \frac{2623}{250}.$$

8. **D**. This is a binomial problem. The probability is $\sum_{k=12}^{600}\binom{600}{k}.03^k.97^{600-k} \approx$ .9477, so the answer is 9 + 4 + 7 + 7 = 27.

9. **D**. First, find the mean of the distribution, which is 3.91. Then subtract the mean from each value, square the differences and multiply those by their corresponding probabilities. When you add the results, you get 3.8419. The square root of that is the solution. It is 1.96007, which rounds to 1.96.

10. **C**. The set Z = (2, 3, 5, 7, 11, 13, 17, 19). The min = 2, the max = 19, the median = 9. The discriminant is $B^2 - 4AC$. Plugging in produces $9^2 - 4(2)(19) = -71$.

11. **B**. Put the information into a Venn Diagram. There are three openings, the situations in which students take exactly two science classes. Call Biology and Physics "A", Biology and Chemistry "B" and Chemistry and Physics "C". The equations produced from each science class are: A + B = 11, B + C = 24 and A + C = 27. Solving these equations gives A = 7, B = 4 and C = 20. Plug the results into the diagram and add all the individual values. 18+4+7+3+12+20+10 = 74.

12. **A**. From the previous problem, there are 74 students. 39 study Chemistry, so there are 35 students involved. Of those 35, 18 study Biology only and 7 study Biology and Physics. Therefore, the answer is $\frac{25}{35} = \frac{5}{7}$.

13. **D**. Hypergeometric Distribution. Standard deviation is $\sqrt{25 \frac{36}{100} \frac{64}{100} \frac{75}{99}} \approx 2.089$.

14. **D**. First create two z-score equations based on the information. They are $-1.51 = \frac{63 - mean}{sd}$ *and* $1.41 = \frac{91 - mean}{sd}$. Solving for the standard deviation gives an exact value of $\frac{700}{73}$. Plugging in produces a mean of 77.47945205, which rounds to the solution.

15. **B**. In order to get a flush, you must get 5 cards of the same suit. Each suit has 13 cards and there are 4 suits. So the probability is $\frac{4({}_{13}C_5)}{{}_{52}C_5} = \frac{5148}{2598960} = \frac{33}{16660}$.

16. **E**. None of them are always positive. Mean and median of a set can be negative. The other four measures can be equal to zero if all the data points in the set are the same.

17. **C**. The distribution is skewed to the left because the mean is less than the median. The lower values of the distribution are dragging the mean down, creating a skew to the left side of the distribution.

18. **A**. First transform the standard deviation from 12 to 8 by multiplying by $\frac{2}{3}$. When you multiply the mean by $\frac{2}{3}$, you get $68\left(\frac{2}{3}\right) = \frac{136}{3}$. In order to get to a new mean of 75, you must add $\frac{89}{3}$. So the transformation equation is $y = \frac{2}{3}x + \frac{89}{3}$. When you plug John's score of 80 in, you get $y = \frac{2}{3}(80) + \frac{89}{3} = \frac{249}{3} = 83$.

19. **C**. This is a T confidence interval because you aren't given the standard deviation of the population. When you plug the numbers in accordingly, you get the solution.

20. **B**. Build a tree diagram. First, 2 percent are positive so 98 percent are negative. For the positive, 93 percent test positive and 7 percent negative. For the negative, 3 percent positive and 97 percent negative. The probability that a student has the disease is (.02)(.93) + (.98)(.03) = .048. The probability that they have the disease and test positive is (.02)(.93) = .0186. So the answer is $\frac{.0186}{.048} = \frac{31}{80}$.

21. **D**. First, $P(A|B)=\dfrac{P(B\cap A)}{P(B)}=\dfrac{P(B\cap A)}{\frac{40}{73}}=\dfrac{1533}{4000}\rightarrow P(B\cap A)=\dfrac{21}{100}$. When you subtract the intersection from each A and B, you determine $P(A'\cap B')=\dfrac{4191}{14600}$.

Using the formula, $P(B'|A')=\dfrac{P(A'\cap B')}{P(A')}=\dfrac{\frac{4191}{14600}}{\frac{5}{8}}=\dfrac{4191}{9125}$.

22. **A**. The formula for slope is $r\dfrac{s_y}{s_x}$. Plugging in produces $.6=r\left(\dfrac{20}{12}\right)\rightarrow r=.36$. This leads to a coefficient of determination $\left(r^2\right)$ that is the solution.

23. **B**. The formula for a binomial standard deviation is $\sqrt{np(1-p)}=\sqrt{125(.85)(.15)}=3.9921\approx 3.99$.

24. **D**. First compute the raw score using the formula $z=\dfrac{raw-mean}{sd}\rightarrow 1.64=\dfrac{raw-500}{\frac{75}{\sqrt{750}}}\rightarrow raw=504.491325$. You use 1.64 because InvNorm(.95) = 1.644853626, which rounds to 1.64. Then plug the raw score in with the alternate mean. $\dfrac{504.491325-505}{\frac{75}{\sqrt{750}}}=-.185741848$. This leads to a p value of .5736763847, which rounds to the solution.

25. **D**. There are 8 total treatments, four types of dog food each at two calcium levels.

26. **A**. The mean of the data is 50. When you subtract the mean from each value, square the differences and add them up, you get 7168. You then divide by (n-1) or 9 in this case. This leads to $\sqrt{\dfrac{7168}{9}}=\dfrac{32\sqrt{7}}{3}$.

27. **D**. The formula for margin of error is $m=\dfrac{z\sigma}{\sqrt{n}}\rightarrow 50=\dfrac{1.96(300)}{\sqrt{n}}\rightarrow n=138.2976\approx 139$.

28. **A**. For perfect independence, the ratio across the rows or down the columns must be the same. $\dfrac{112.5}{30}=3.75$, therefore $\dfrac{18}{x}=3.75\rightarrow x=4.8$.

29. **C**. The mean of a geometric distribution is $\frac{1}{p}$. The probability of getting a blue M+M is $\frac{10}{24}$, so the mean of the distribution is 2.4. The standard deviation of a geometric distribution is $\sqrt{\frac{1-p}{p^2}}$. Plugging in produces

$$\sqrt{\frac{1-\frac{10}{24}}{\left(\frac{10}{24}\right)^2}} = \sqrt{\frac{\frac{14}{24}}{\frac{100}{576}}} = \sqrt{3.36} = 1.833 \approx 1.83.$$

30. **A**. The number of education majors is 17562(.12) + 19368(.16) = 5206.32. The percent of education majors at FSU is $\frac{5206.32}{36930} = .1409780666$. Multiply the percent by the sample size of 250 to get 35.24451665, which rounds to the solution.