1. **38**. To find the mean, add the numbers and divide by 10. The sum is 380, and when you divide, you get the solution.

2. $\mathbf{y = 1.4x + 89.2}$ or $\mathbf{y = \frac{7}{5}x + \frac{446}{5}}$. The equation for the line of best fit is

$y - \overline{y} = r\frac{S_y}{S_x}\left(x - \overline{x}\right)$. Plugging in the appropriate values gives you

$y - 50 = (.8)\left(\frac{7}{4}\right)(x + 28)$. This leads to $y - 50 = 1.4(x + 28)$. This leads to the final

solution. $y - 50 = 1.4x + 39.2 \rightarrow y = 1.4x + 89.2$.

3. $\mathbf{\frac{7}{12}}$. The formula for $P(A|B) = \frac{P(A \cap B)}{P(B)}$. Plugging in appropriately gives

$.3 = \frac{P(A \cap B)}{.5} \rightarrow P(A \cap B) = .15$. Using this and the given information in a Venn diagram gives A only as .25, A and B as .15, B only as .35 and neither A nor B as .25. Using the formula again, $P(B|A') = \frac{P(B \cap A')}{P(A')}$. Using the given, P(A')=0.6. The $P(B \cap A') = .35$. So the final answer is

$\frac{.35}{.60} = \frac{7}{12}$.

4. **5.6** or $\mathbf{\frac{28}{5}}$. To find the mean, multiply the value times its probability and add the products together.
.1+.45+.8+.6+1.4+2.25= 5.6

5. **2.8** or $\mathbf{\frac{14}{5}}$. To find the variance, find the mean, subtract the mean from each value, square the differences, and multiply each squared difference by its probability. The mean of the variable is 4, and the squared differences in order from left to right are 9, 4, 0, 1, 4. So the variance is 9(.1)+4(.2)+1(.3)+4(.2)= 2.8

6. **5.875** or $\mathbf{\frac{47}{8}}$. Each number on the die should be rolled 16 times in order for the die to be fair. The

formula for chi-square is $\sum\frac{(obs - \exp)^2}{\exp}$. So the chi-square value for this problem is

$$\frac{(10-16)^2}{16} + \frac{(15-16)^2}{16} + \frac{(20-16)^2}{16} + \frac{(20-16)^2}{16} + \frac{(12-16)^2}{16} + \frac{(19-16)^2}{16} =$$
$$\frac{36+1+16+16+16+9}{16} = \frac{94}{16} = \frac{47}{8}.$$

7. **48**. Putting the numbers into a three circle Venn diagram, creates a situation where the numbers given are too big to work properly. Therefore, each number involving two classes must be subtracted by 5 because they are being counted twice. This results in 3 in English and Science, 4 in English and Math, and 6 in Math and Science. Putting the correct numbers in and subtracting for the single classes of each subject produces 12 in English only, 10 in Math only and 8 in Science only. The total number of seniors is 12+4+3+5 from the English circle and then 10+6 from the Math circle and 8 from the Science circle counting each number once gives a total of 48.

8. **36.5** or $\mathbf{\frac{73}{2}}$. To find the median, put the numbers in order and find the mean of the fifth and sixth terms. The sum of those terms is 73, and the mean is the solution.

9. $\mathbf{\frac{8}{13}}$. To find the probability, we use the union formula $P(A \cup B) = P(A) + P(B) - P(A \cap B)$. This results in $\frac{26}{52} + \frac{12}{52} - \frac{6}{52} = \frac{32}{52} = \frac{8}{13}$.

10. $\mathbf{\frac{17}{55}}$. There are four possibilities for this problem: 1. Red, Red 2. Red, Blue 3. Blue, Red 4. Blue, Blue. We need to find #1 and #3 and add the results together to find the solution. That is as follows: $\left(\frac{6}{15} \bullet \frac{4}{11}\right) + \left(\frac{9}{15} \bullet \frac{3}{11}\right) = \frac{24}{165} + \frac{27}{165} = \frac{51}{165} = \frac{17}{55}$.

11. **.2048** or $\mathbf{\frac{128}{625}}$. This is a binomial probability. The result is ${}_5C_3\left(.8\right)^3\left(.2\right)^2 = .2048$.

12. **34**. To find the transformation equation, you must first change the standard deviation from 6 to 4 by multiplying by (2/3). So a= (2/3). When you multiply the mean of 70 by (2/3), you get $\frac{140}{3} = 46\frac{2}{3}$. To get to the new mean of 80, you must add $33\frac{1}{3}$. So b= $33\frac{1}{3}$ and the sum of a + b= 34.

13. **4**. To find each of their raw scores, multiply their z-scores by the standard deviation and then add the mean. The results are 1.3(5)+78= 84.5 and 2.1(5)+78= 88.5. The positive difference between them is the result.

14. **93**. Find the sum of the first five tests, which is 423. To average 86 on the first six tests, the total must be 516. 516-423= 93.

15. $\mathbf{\frac{10\sqrt{6}}{3}}$. The mean of serves is equal to np, or 100(.4)= 40. The standard deviation is equal to $\sqrt{np(1-p)}$, or $\sqrt{100(.4)(.6)} = \sqrt{24} = 2\sqrt{6}$. So when you plug in you get the following: $\frac{40}{2\sqrt{6}} = \frac{20}{\sqrt{6}} = \frac{20\sqrt{6}}{6} = \frac{10\sqrt{6}}{3}$.

16. **31**. To find the interquartile range, put the numbers in order, find the median, then find the median of the first half of numbers and the median of the second half. The first quartile is 21 and the third quartile is 52. 52-21= 31.

17. $\mathbf{\frac{1}{16}}$. The formula is $\left(1-p\right)^n$, where p is the probability and n is the number of tosses. Therefore, the result is $\left(1-\frac{1}{2}\right)^4 = \frac{1}{16}$.

18. **5**. To find the predicted value of Mohammad's final exam, plug 90 in for x. The resulting value is equal to 80. His residual therefore is 85-80=5.

19. **.515** or $\frac{103}{200}$. There are 400 total people in the chart. The probability of letter A is $P(Man \cup E) = P(Man) + P(E) - P(Man \cap E)$. That result is $\frac{194}{400} + \frac{100}{400} - \frac{40}{400} = \frac{254}{400} = \frac{127}{200}$. The probability of letter B is the number of Women Math majors divided by the total number of people, which is $\frac{48}{400} = \frac{24}{200}$. The value of A-B is $\frac{127}{200} - \frac{24}{200} = \frac{103}{200}$.

20. $\frac{3\sqrt{10}}{2}$. The mean of the data is 7. Subtracting the mean from each value produces -6, -3, 0, 3, 6. Squaring the differences produces 36, 9, 0, 9, 36. Adding them up totals 90. Dividing by (n-1), or 4 in this case, gives a variance of $\frac{45}{2}$. Taking the square root of that produces $\sqrt{\frac{45}{2}} = \frac{3\sqrt{5}}{\sqrt{2}} = \frac{3\sqrt{10}}{2}$.

21. $\frac{59}{63}$. To find A, total the number of men, which is 140. There are 30 male science majors, so A= $\frac{30}{140} = \frac{3}{14}$. For B, there are 60 History majors, 10 of whom are women. So B=$\frac{10}{60} = \frac{1}{6}$. For C, total the entire set of data, which is 240 and subtract the English majors, which is 60, for a total of 180. There are 100 men in the other three majors, so C=$\frac{100}{180} = \frac{5}{9}$. So (A+B+C)=$\frac{3}{14} + \frac{1}{6} + \frac{5}{9} = \frac{27}{126} + \frac{21}{126} + \frac{70}{126} = \frac{118}{126} = \frac{59}{63}$.

22. **.49** or $\frac{49}{100}$. The coefficient of determination is r^2. To find r, we know that the slope of the line of best fit=$r\frac{S_y}{S_x}$. So, plugging in what we know from the given, produces $-1.2 = r\left(\frac{12}{7}\right) \rightarrow r = -.7$. Therefore, $r^2 = .49$.

23. **37**. To find X, we must find the median of the first half of numbers before the median. So, $\frac{20+X}{2} = 23$. So X=26. To find Y, we must find the median of the second half of numbers after the median. So, $\frac{58+Y}{2} = 60.5$. So Y=63. 63-26=37.

24. $\frac{99}{140}$. Typing the data into a graphing calculator produces the following results: A= 22, B= 20, C= 27, D=42. Plugging the results in produces $\frac{22(27)}{20(42)} = \frac{594}{840} = \frac{99}{140}$.

25. $\frac{7}{13}$. A=$\frac{12}{52} = \frac{3}{13}$. B=$\frac{2}{52} = \frac{1}{26}$. C=$\frac{1}{2}$. When you plug in the results, you get

$$\frac{\frac{3}{13} + \frac{1}{26}}{\frac{1}{2}} = \frac{\frac{7}{26}}{\frac{1}{2}} = \frac{7}{13}$$