January Regional Statistics Individual Solutions

1. Range = Max – Min
   = 31 – (-3)
   = 34 **D**

2. Standard Deviation of sample is 10.86 (for population is10.05)
   Variance of sample is 10.86^2 and for population 10.05^2
   Range is 34 from # 1
   IQR is 11 (15 – 4 Of these choices the variance is the largest whether you use sample or population) **B**

3. All five of these can never be negative. **D**

4. Purpose of linear regression is predicting the dependent variable (aka response variable) if given the explanatory (aka independent) variable. **D**

5. The total area under the curve is not **approximately** 1. It is **exactly** 1. **C**

6. If two events are mutually exclusive (aka disjoint), there is no intersection of the two events. **D**

7. Statement D is false because range is not a measure of position. It measures the spread. **D**

8. The expected value is (0.2)(30), which is 6. To find the probability that there are exactly 6 native Floridians in a class of 30, use: binompdf (30, 0.2, 6) The result is 0.1795 **A**

9. The standard deviation of Mrs. Smith's pretest is zero as is the standard deviation of the posttest. The domain error is caused by the attempt to divide by 0 in the denominator of the correlation as both Sx and Sy are 0. The answer A is not correct because it is not the fact that students got a particular score; it is the fact that the standard deviations are both zeros and we are dividing by these zeros. **C**

10. There is only one factor and it is gasoline. **A**

11. There are four levels of gasoline: Exon, Mobil, Shell and Texaco. **C**

12. The number of levels times the number of factors gives you the number of treatments. Those treatments are: Exon, Mobil, Shell and Texaco. **C**

13. The statisticians have blocked by car size. The three blocks are small, midsize and large vehicles. **B**

14. Researchers cannot incorporate double blinding in the experiment because the subjects must know what type of exercise they are doing, and they do not need to incorporate single blind condition as the measure (of weight loss) is not a subjective measure that could be influenced by the knowledge of which treatment is received. **D**

15. Random allocation is the process of deciding which men will be included in which exercise group. **C**

16. The variable of interest is the weight **loss**, not the actual weight of each man nor amount of weight each man could lift. **B**

17. Look up 0.42 on the table or in inverse norm (because .58 is above, so 0.42 will be below). **B**

18. $IQR = Q_3 - Q_1$ The absolute value of $Q_1 - Q_3$ will give you the same thing. **D**

19. The expected value of home buyers would be (.60)(5) = 3. **A**

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20. Solve for x first in $\log_2 x + \log_2 (x - 4) = 5$

$\log_2 x(x-4) = 5$

$2^5 = x^2 - 4x$

$X^2 - 4x - 32 = 0$

$(x + 4)(x - 8)$

Answers are -4 and 8

Substitute 8 in for x

Find the value of y: $0.1 + 0.05 + 0.1 + y + 3y + 0.5 = 1.0$

$Y = 0.175$ and $3y = 0.525$ **A**

21. $b = r (Sy/Sx)$ r could be positive or negative, but the slope would be 10 or -10 and neither answer is included **E**

22. binomialpdf (10, .9, 10) = 0.3487 Read the question carefully. 90% of the time they are given correct information. What is the probability that **none** of them are given **incorrect** information. This is the same as saying that all of them are given correct information. **D**

23. $\hat{y} = -17 + 1.3 (65)$

$\hat{y} = 67.5$ Substitute predicted value into the Residual formula

$Y - \hat{y} = \text{Resid}$

$Y - 67.5 = 10$

$Y = 77.5$ **D**

24. For every inch taller the parent is, the child is predicted to be 1.3 inches taller (slope explanation). **A**

25. The intercept is present, but is meaningless because the intercept means that we are looking at the height of a child who has a 0 inch tall parent. **D**

26. Use z scores. Probability is 0.04 **B**

27. To miss the next two shots when the probability is represented in terms of shooting success would mean that you get 0 out of 2. So binomial pdf (2, 0.8, 0) = 0.04 **A**

28. This is not binomial as there are not a fixed number of trials. This is not geometric, as he does not want only 1 success. The conditions for binomial and geometric are not met, so the answer is **E**.

29. Use a z score with 1.28 as the cut off as you want top ten percent (ten out of 100). **B**

30. 100 + 6 + 6 = 112 This is two standard deviations above the mean. **D**