SM3 HW #7-6 (Unit 7 Test Preview) (LAST VERSION, I HOPE)   Period____

1) All 150 NUAMES Secondary Math-3 students took a comprehensive final exam. The mean grade
   was 85% and the standard deviation was 5%.
   f you randomly selected a Math-3 student who took the test, what is the probability that the student
   scored within 2 standard deviations of the mean?

   A) 68%   B) 34%   C) 95%   D) 99.7%

2) All 150 NUAMES Secondary Math-3 students took a comprehensive final exam. The mean grade
   was 85% and the standard deviation was 5%.
   How many students in the data set scored between 85% and 90%?

   A) 34   B) 71   C) 75   D) 102

3) All 150 NUAMES Secondary Math-3 students took a comprehensive final exam. The mean grade
   was 85% and the standard deviation was 5%.
   What portion of the students in the data set scored between 75% and 85% on the test?

   A) 34%   B) 47.5%   C) 2.35%   D) 68%

4) All 150 NUAMES Secondary Math-3 students took a comprehensive final exam. The mean grade
   was 85% and the standard deviation was 5%.

   What percentage of the students scored between 80 and 90%

   A) 34%   B) 95%   C) 68%   D) 13.5%

5) The same 150 students also happen to be the only students taking the "underwater basket weaving
   class" (UWBW) (a submariner term for a super-easy class). The mean score for the UWBW final
   exam was 90% with a standard deviation of 4%.
   Joe Schmuckatelli (a submariner term for a regular guy) got an 80% on the Math test from problem
   #1 and an 86% on the Basketweaving class.
   On which test did he do better on?

  A) He scored higher, compared to those who took both tests because his Math score was at
      the mean for the class--> he scored higher than 50% of those taking the test. His basket
      class score was 1 std dev below the mean--> only 16% scored lower than he did.
  B) You can't tell because he mean and standard deviations for the two classes are different.
  C) The same because in both cases he scored higher than 16% of those taking the test.
  D) The math test because the basket weaving class was a much easier class than math.

6) If you want to determine if a medication is effective in reducing blood pressure in 30-40 year old males with elevated blood pressure. What is your "null hypothesis" for the study?

A)   The treatment has an no effect on the post-treatment blood pressure mean --> the difference in the pre- and post-treatment means is not large enough to conclude that the effect of the medication is any different than the difference that would be expected from two samples because each mean would normaly vary from sample to sample.
B) That the medication doesn't work
C) The effect of the medication on the post-treatment blood pressure mean is significant --> the difference in the means is large enough to conclude that the effect of the medication on the blood pressure mean is large enough that it cannot be attributed to the normal variation from one sample to another.
D) That the medicaton works.

7) If you want to determine if a medication is effective in reducing blood pressure in 30-40 year old males with elevated blood pressure.
If you selected the individuals whose last names started with letters from the 1st half of the alphabet, what type of sampling method did you use?

A) systematic sample method   B) convenience sample method
C) random sample method   D) self-selected sample method

8) If you want to determine if a medication is effective in reducing blood pressure in 30-40 year old males with elevated blood pressure: What type of statistical study will you use?

A) systematic study   B) observational study
C) experimental study   D) sample study

9) Select the most correct response for trying to find the mean height of a population of adult males.

A) If there were 100 different samples taken, 95 of the sample means would equal the population mean.
B) There is a 95% probability that the population mean equals the sample mean.
C) We are 95% confident that the population mean falls within 2 sample standard deviations of the sample mean. We don't really know the actual population mean height.

10) 15 teenagers at the mall were randomly selected. Each was asked how much money did they bring with them. The following data was collected.
{2, 4, 6, 8,10,10,15, 20, 20, 20, 25, 30, 35, 40, 50}
What is Q1?

A) 7   B) 8   C) 30   D) 6

11) 15 teenagers at the mall were randomly selected. Each was asked how much money did they bring with them. The following data was collected.
{2, 4, 6, 8,10,10,15, 20, 20, 20, 25, 30, 35, 40, 50}
What is Q3?

A) 8   B) 32.5   C) 27.5   D) 30

12) 15 teenagers at the mall were randomly selected. Each was asked how much money did they bring with them. The following data was collected. {2, 4, 6, 8,10,10,15, 20, 20, 20, 25, 30, 35, 40, 50} (same as problem #10)
Is the data normally distributed?

A) yes   B) no

13) On a different day at the mall another sample was collected from 15 teeangers (they were asked how much money they brought with them).
{2, 4, 6, 8,10,10,15, 20, 20, 20, 25, 30, 35, 35, 36}
Is the data normally distributed?

A) yes   B) no

14) On a different day at the mall another sample was collected from 15 teeangers (they were asked how much money they brought with them).
{2, 4, 6, 8,10,10,15, 20, 20, 20, 25, 30, 35, 35, 36}
What is the 68% confidence interval?

A) 6.6 - 32.2   B) 6.8 - 33.2   C) 7.2 - 34.6   D) 6.6 - 30.2

15) A certain math teacher is interested in conducting a statistical study on data that has been obtained throughout the year to determine the relatonship (if any) of homework completion rates and test scores. The data obtained indicated that for students who completed between 60-70% of their homework the average test score was 80%. For students who completed 70-80% of their homework the average test score was 87%. For students who completed 80-100% of their homework, the average test score was 91%. What type of study die he perform for this situation?

A) experimental study   B) observational study   C) sample study

16) A certain math teacher is interested in conducting a statistical study on data that has been obtained throughout the year to determine the relatonship (if any) of homework completion rates and test scores. The data obtained indicated that for students who completed between 60-70% of their homework the average test score was 80%. For students who completed 70-80% of their homework the average test score was 87%. For students who completed 80-100% of their homework, the average test score was 91%. How can you sumarize the results of the study?

A) There was a negative correlation between homework completion rate and test scores.
B) The study showed a positive correlation between homework completion rate and test scores.
C) If you study more you will get a higher test score.

17) The amount of money in a bank account (as a function of time) that is compounded is given by

$$A(t) = P\left(1 + \frac{r}{k}\right)^{kt}$$

where P is the "principal", 'r' is the anual interest rate, 'k' is the number of times interest is paid per year, and 't' is the number of years the money has been in the account. How long does it take for the principal to double in an account earning 5% annual interest compounded quarterly? (solve either algebraically or graphically).

A) 12.1 yrs   B) 14.2 yrs   C) 13.9 yrs   D) 22.3 yrs

Perform the indicated operation.

18) $g(n) = n^2 - 5n$
Find $(g \circ g)(n)$

A) $n^4 + 10n^3 + 20n^2 - 25n$
B) $-4n - 12$
C) $n^4 - 4n^3 + 6n^2 - 4n$
D) $n^4 - 10n^3 + 20n^2 + 25n$

19) $f(t) = 2t + 2$
$g(t) = t^2 - 1$
Find $(f \circ g)(-2)$

A) 8   B) 0
C) 98   D) 3

Find the inverse of each function.

20) $g(n) = (n - 2)^5$

A) $g^{-1}(n) = \sqrt[3]{-n + 3}$
B) $g^{-1}(n) = \sqrt[3]{\dfrac{-n - 1}{2}}$
C) $g^{-1}(n) = \sqrt[5]{n} + 2$
D) $g^{-1}(n) = \sqrt[5]{n}$

21) $g(n) = \dfrac{3}{n - 2} - 1$

A) $g^{-1}(n) = -\dfrac{1}{n - 1} - 2$
B) $g^{-1}(n) = -\dfrac{2}{n} - 2$
C) $g^{-1}(n) = -\dfrac{4}{n} + 1$
D) $g^{-1}(n) = \dfrac{3}{n + 1} + 2$

22) $g(x) = \dfrac{4x}{3x-2} - 1$

$g^{-1}(x) = ?$

A) $g^{-1}(n) = \sqrt[5]{n+2}$

B) $g^{-1}(x) = \dfrac{2x+2}{3x-1}$

C) $g^{-1}(n) = 2n^3 + 2$

D) $g^{-1}(n) = -n^3 + 3$

Rewrite each equation in exponential form.

23) $\log_n 49 = m$

A) $n^m = 49$ B) $m^{49} = n$

C) $49^m = n$ D) $m^n = 49$

Rewrite each equation in logarithmic form.

24) $18^m = 127$

A) $\log_{18} 127 = m$

B) $\log_{127} 18 = m$

C) $\log_{18} m = 127$

D) $\log_m 18 = 127$

Condense each expression to a single logarithm.

25) $\log_7 x + \log_7 y + 5\log_7 z$

A) $\log_7 \left(yxz^5 \right)$ B) $\log_7 \dfrac{x^{20}}{y^4}$

C) $\log_7 \sqrt{zyx}$ D) $\log_7 \left(y^4 x^5 \right)$

Find the inverse of each function.

26) $y = \log_2 x + 9$

   A) $y = -\dfrac{5^x}{3}$ B) $y = 2^{x-9}$

   C) $y = -\dfrac{10^x}{3}$ D) $y = 2^{x+4}$

27) $y = 3^x - 5$

   A) $y = \log_3 4x$

   B) $y = \log_5 3x$

   C) $y = \log_3 (x + 5)$

   D) $y = \log_6 (x - 2)$

Solve each equation.

28) $-3\log_9 (n - 2) = -3$

   A) $\{11\}$ B) $\{2\}$

   C) $\left\{-\dfrac{1}{4}\right\}$ D) $\left\{\dfrac{1}{24}\right\}$

29) $\log_{12} (v + 7) - 8 = -6$

   A) $\{137\}$ B) $\{-5\}$

   C) $\{-1\}$ D) $\left\{-\dfrac{1}{8}\right\}$

Solve each equation. Round your answers to the nearest ten-thousandth.

30) $-5.1 \cdot 6^{x-8} = -36$

   A) 8.8487   B) 9.0907

   C) No solution.   D) 9.9543

31) $9^{n+2.2} - 10 = 6$

   A) -0.9381 B) 0.5726

   C) 0.6119   D) -0.9959

Solve each equation.

32) $9^{2x-3} = 27^{-2x-3}$

   A) $\{2\}$ B) $\{1\}$

   C) $\left\{\dfrac{3}{5}\right\}$ D) $\left\{-\dfrac{3}{10}\right\}$

Solve each system by elimination. Show your work! (No work--no points).

33) $-6x - y = -14$
 $6x + y = 14$
A) $(-2, -9)$
B) Infinite number of solutions
C) $(2, -9)$
D) $(-9, 2)$

34) $5x + 3y = -23$
 $-5x - 2y = 17$
A) $(-1, -6)$
B) $(-7, -10)$
C) $(-6, -1)$
D) Infinite number of solutions

Solve each system by substitution. Show your work!

35) $y = 7x - 2$
 $y = 4x + 1$
A) $(1, -5)$ $\qquad$ B) $(1, 5)$
C) $(-5, 1)$ $\qquad$ D) $(3, 3)$

36) $x + 6y = -7$
 $-x - 6y = 1$
A) No solution $\qquad$ B) $(4, -5)$
C) $(4, 5)$ $\qquad$ D) $(-1, 5)$

37) Solve.
 $n^2 - 10 = -7$
A) $\{\sqrt{3}, -\sqrt{3}\}$
B) $\{-10, 10\}$
C) $\{2i\sqrt{2}, -2i\sqrt{2}\}$
D) $\{i\sqrt{10}, -i\sqrt{10}\}$

38) Find the zeroes.
 $x^2 + 14x - 39 = 0$
A) $\{-9 + \sqrt{37}, -9 - \sqrt{37}\}$
B) $\{7 + \sqrt{10}, 7 - \sqrt{10}\}$
C) $\{-2, -4\}$
D) $\{-7 + 2\sqrt{22}, -7 - 2\sqrt{22}\}$

Solve each system by elimination.

39) $-5x + 4y + 6z = -25$
 $-2x + 3y - 4z = 29$
 $4x - 3y - 2z = 7$
A) $(5, -1, -4)$ $\qquad$ B) $(-4, -6, 0)$
C) $(5, 1, -4)$ $\qquad$ D) $(3, 5, -5)$

40) $6r - 6s - t = -16$
 $6r - 2s + 6t = 4$
 $5r + 6s + 2t = -24$
A) $(4, -4, -2)$ $\qquad$ B) $(-1, 0, -4)$
C) $(-4, -2, 4)$ $\qquad$ D) $(-2, -4, 4)$