Math 153 - Quiz 5
September 29, 2016

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (5 points) Refer to the ammonium ion concentration data on the back of the page.

   (a) At what percentile is the concentration 3.0?

   $\frac{12}{50} = 24\% \Rightarrow$ 24TH PERCENTILE

   (b) What concentration is at the 90th percentile?

   $\frac{L}{50} = 0.90 \Rightarrow L = 45$ $\qquad \frac{45^{TH} + 46^{TH}}{2} = \frac{5.5 + 5.6}{2}$

   $= 5.55$

   (c) What concentration is at the 65th percentile?

   $\frac{L}{50} = 0.65 \Rightarrow L = 32.5 \Rightarrow 33^{RD} = 4.4$

2. (5 points) Julio scored 180 on a math test with mean 157.9 and standard deviation 27.3. Mary scored 43 on a physics test with mean 38.1 and standard deviation 6.2.

   (a) Compute the corresponding z scores. Who scored better?

   JULIO: $z = \frac{180 - 157.9}{27.3} \approx 0.81$

   MARY: $z = \frac{43 - 38.1}{6.2} \approx 0.79$

   JULIO'S SCORED BETTER, RELATIVELY SPEAKING.

   (b) Compute the coefficients of variation for the tests. Which tests (math or physics) had greater variation?

   MATH: $\frac{27.3}{157.9} \approx 17.3\%$ $\qquad$ PHYSICS: $\frac{6.2}{38.1} \approx 16.3\%$

   MORE VARIATION IN MATH TESTS.

   (c) What would be an unusally high score on the math test?

   $157.9 + 2(27.3) = 212.5$

   ANY SCORE GREATER THAN 212.5 WOULD BE UNUSUALLY HIGH.

Concentration of Ammonium Ions in 50 Samples

(In Percentages)

1.4	2.3	2.4	2.6	2.6	2.7	2.7	2.8	2.8	2.9
2.9	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.5
3.6	3.7	3.7	3.9	3.9	4.0	4.0	4.1	4.1	4.2
4.2	4.2	4.4	4.5	4.6	4.6	4.6	4.7	4.8	4.8
4.8	4.9	5.2	5.2	5.5	5.6	5.7	6.5	7.0	13.3