

Quiz 3 for Statistics 301
Elementary Statistical Methods - Spring 2001
Material Covered: Chapter 7 of Workbook and text
Friday, 23rd February

This is a 15 minute quiz, worth 5% and marked out of 5 points. The total possible points awarded for each question is given in square brackets at the beginning of each question.

Name (please print): _____ . ID Number: _____
last first

1. [1 point] Circle true or false.
 - (a) **True / False** For any population, the sampling distribution of sample means and the sampling distribution of sample variances will have the same shape provided the same sample size is used in both distributions.
 - (b) **True / False** The *standard error of the mean* has the same meaning as the *standard deviation of the sample mean*.

2. Random samples of size 50 each are selected from a normal population where $\mu = 78.1$ and $\sigma = 16.2$.
 - (a) [1 point] $P(71.1 < X < 85.1) \approx$
(circle closest one) **0.215 / 0.263 / 0.334 / 0.432 / 0.496**.
 - (b) [1 point] $P(71.1 < \bar{X} < 85.1) \approx$
(circle closest one) **0.989 / 0.991 / 0.995 / 0.998 / 0.999**.

3. [2 points] Suppose a random sample is taken, assuming a normal distribution with mean 80 and standard deviation of 12. What must be the sample size so that the middle 90% of the sampling distribution of sample means falls between 78.35 and 81.65?
(Hint: Draw a normal-shaped curve and shade 90% between $-z$ and z ; in other words, notice that z must be the 95th percentile and equal to 1.65. Also notice that 81.65 is 1.65 units above the mean 80. Finally, remember that the standard deviation of the average is $\frac{12}{\sqrt{n}}$.)

(1) **False, True**

(2a) **0.334** ($\text{normalcdf}(71.1, 85.1, 78.1, 16.2)$)

(2b) **0.998** ($\text{normalcdf}(71.1, 85.1, 78.1, 16.2/\sqrt{50})$)

(3) **144** (since $z = \frac{81.65 - 80}{\frac{12}{\sqrt{n}}} = 1.65$, $\frac{12}{\sqrt{n}} = 1$, $n = 144$)