

## Quiz 2: Wednesday 09/15/04

Correction:

**Question 1: 0.5 points for each question: total is 3 points**

**Question 2: 1 point**

**Question 3: 1 point for each question, total is 2 points**

**Question 4: 1 point for (1), 1.5 points for (2) and 1.5 points for (3)**

**Total grade is 10**

### Question 1:

Answer by Yes or No the following:

1. For any variable  $X$ , approximately 68% of its values obtained in a sample will lie within one standard deviation of its mean.

NO

2. For a normal variable  $X$ , approximately 68% of its values obtained in a sample will lie within one standard deviation of its mean.

Yes

3. For any variable  $X$ , at least  $3/4$  of its values obtained in experiments will lie within 2 standard deviations of its mean.

NO

4. For a normal variable  $X$ , approximately 95% of its values obtained in experiments will lie within 2 standard deviations of its mean.

Yes

5. For any variable  $X$ , approximately 88% of its values obtained in experiments will lie within 3 standard deviations of its mean.

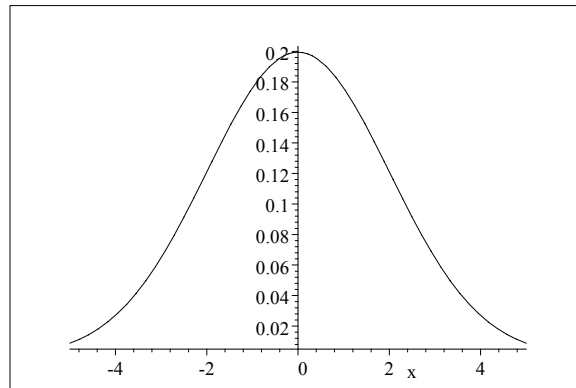
No

6. For a symmetric and bell-shaped distribution of a variable  $X$ , we expect at least 99% of its values obtained in experiments to lie within 3 standard deviations of its mean.

Yes

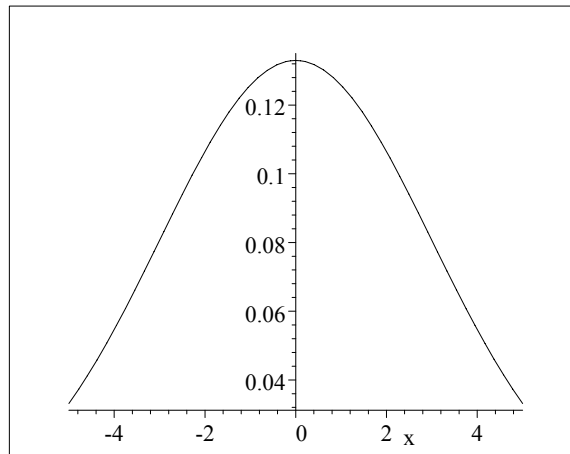
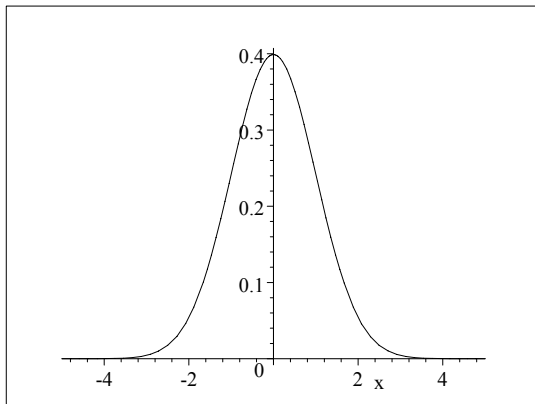
**Question 2:**

1. What is the area underneath the following density curve?



Area=1

**Question 3:**



The two normal curves plotted above (plot 1 on the left, plot 2 on the right) have the same mean  $\mu = 0$  and different standard deviations.

1. Which plot has a standard deviation equal to 3 and which one has a standard deviation equal to 1.
2. Why?

Answer

1. Plot 1 has a standard deviation equal to 1, Plot 2 has a standard deviation equal to 3
2. Plot 1 is sharper than plot 2 so the standard deviation of the first Plot must be smaller than the one for Plot 2

**Question 4:**

We suppose that the Stat 201 scores,  $X$ , of a previous semester have a normal distribution with mean  $\bar{X} = 81.5$  and variance  $s^2 = 20.25$

1. What is the proportion of students who have a score larger than 86?

2. What is the proportion of students who have score smaller than 72.5?
3. What is the proportion of students who have score between 68 and 86?

Answer:

16% of  $X$  is above 86

2.5% of  $X$  is below 72.5

84% of  $X$  is between 68 and 86