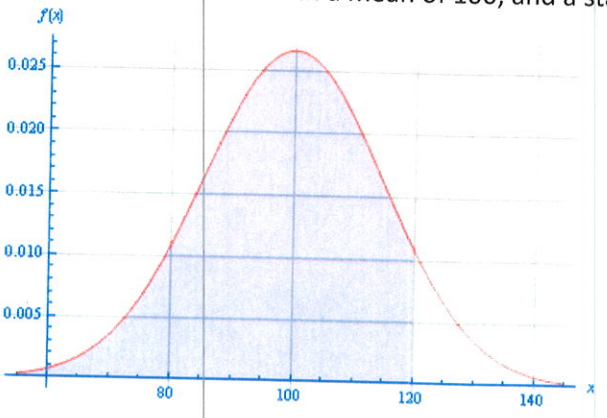
MAT 135, Discussion Questions 3.28

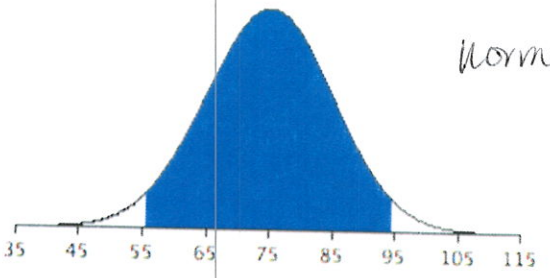
1. Find the shaded area with a mean of 100, and a standard deviation of 15.




normalcdf(-E99, 120, 100, 15)
= .9087887

around 90.9%

2. Find the shaded area under the curve for the cut-off values $x = 56, x = 94$ for the mean of the distribution at 75, and a standard deviation of 10.

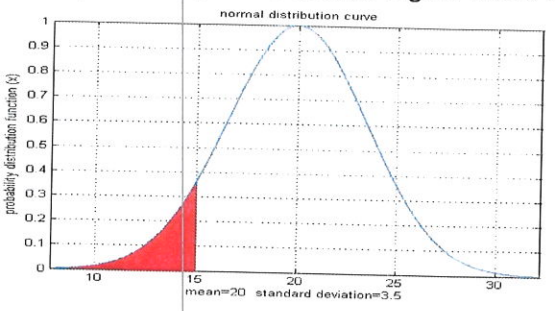



normalcdf(56, 94, 75, 10) =

.942567

around 94.3%

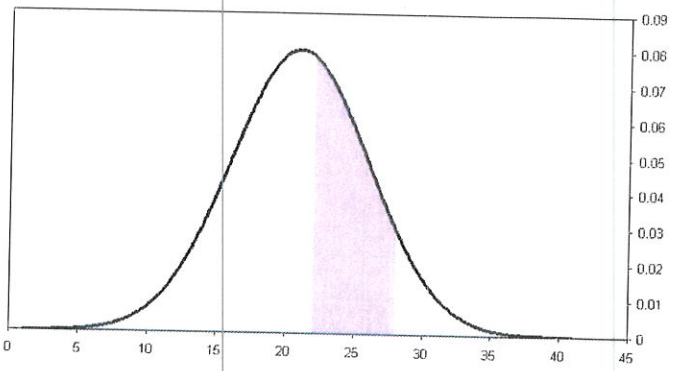
3. Find the probability of the shaded region with a mean of 20 and a standard deviation of 3.5.




normalcdf(-E99, 15, 20, 3.5) =
= .07656

Around 7.7%

4. Mean is 21, and standard deviation is 5. The cut-off values are 22 and 28.



normalcdf(22, 28, 21, 5) =
.33998

around 34%

5. Suppose that the mean IQ of a certain high school is 109, with a standard deviation of 13. What is the standard score (z-score) of a student with an IQ score of 125?

$$z = \frac{125 - 109}{13} \approx 1.230769$$
$$\approx 1.23$$

6. What is the probability that a student in the school (in #10) will have an IQ below 125?

normalcdf(-E99, 125, 109, 13) = .890795

around 89.1%

7. What is the probability that a student in the school (in #10) will have an IQ above 125?

1 − .890795 = .10920...

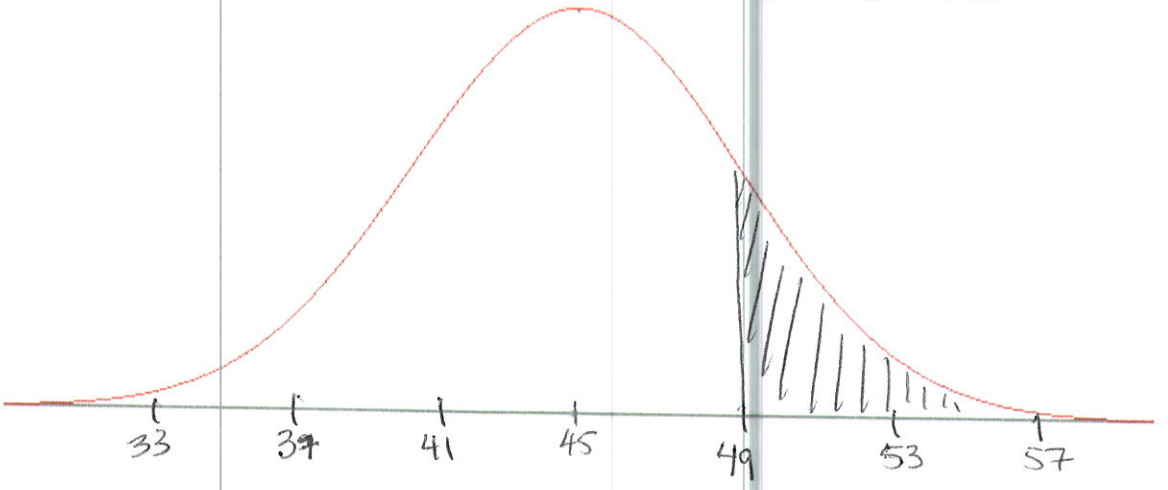
around 10.9%

8. What is the percentile ranking represented by an IQ of 125?

89th percentile

On the blank normal distribution graphs below, mark the mean and additional values in units of standard deviations. Shade the region described by the situations for each problem.

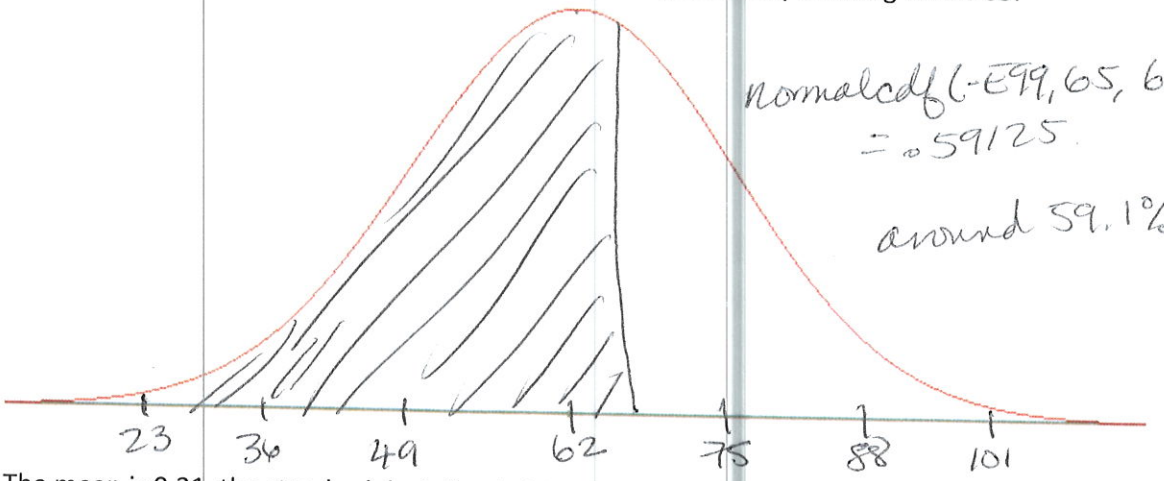
9. The mean is 45, the standard deviation is 4. Find the probability of being above 49.




normalcdf(49, E99, 45, 4) = .158655

around 15.9%

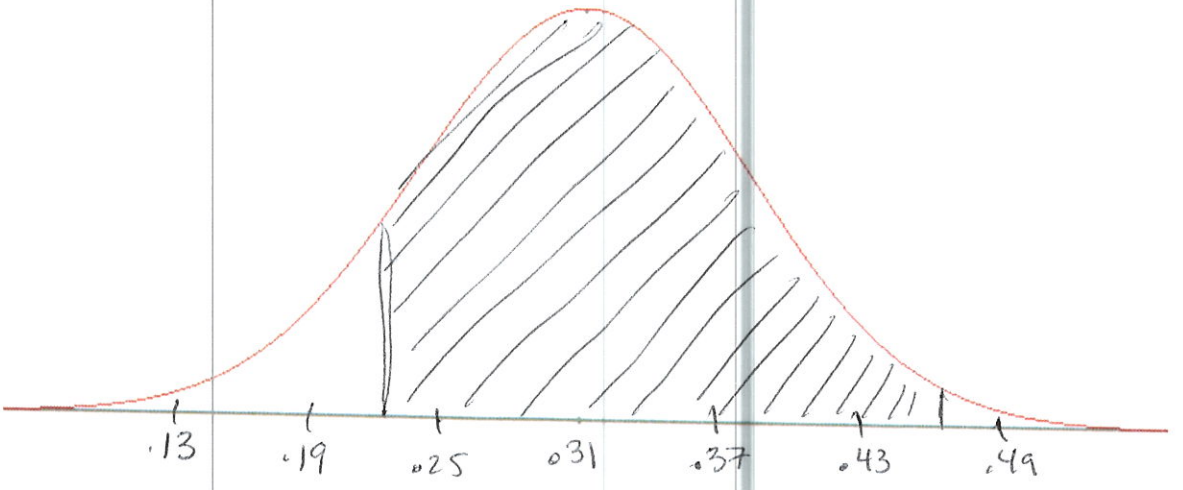
10. The mean is 62, the standard deviation is 13. Find the probability of being below 65.




normalcdf(-E99, 65, 62, 13)
= .59125

around 59.1%

11. The mean is 0.31, the standard deviation is 0.06. Find the probability of being between 0.22 and 0.48.




normalcdf(.22, .48, .31, .06)

= .930889

around 93.1%