The SAT Critical Reading scores in 2014 the US are normally distributed with mean \( \mu_Y = 497 \) and standard deviation \( \sigma_Y = 115 \).

1. 95% of the scores fall between?

Answer: We know that 95% of the scores fall between -1.96 Z-score and +1.96 Z-score. So to answer this answer, we need to compute the SAT score corresponding to -1.96 Z-score and the SAT score to the +1.96 Z-score.

\[ Y = \mu_Y + Z_i \sigma_Y, \text{ so the lower end is } 497 + (-1.96) \times 115 = 271.6, \text{ and the upper end is } 497 + 1.96 \times 115 = 772.4 \]

So 95% of the scores fall between 271.6 and 772.4.

2. What percent of students have a score higher than 612?

Answer: We need to compute the Z-score for 612 to know the percentage of students with a score higher than 612.

\[ Z_{612} = \frac{(612 - 497)}{115} = 1. \]

There are two ways of getting the % of students with a score higher than 612.

Option 1: Use the proportions under the normal curve. In the the normal curve figure provided, we can see that proportion higher than the Z-score of 1 is 0.1359 + 0.0214 + 0.0013 = 0.1586, that is, 15.86%.

Option 1: Use the cumulative percentage under the normal curve. In the normal curve figure provided, we can see that the cumulative percentage for the Z-score of 1 is 84.1%, so the percentage for Z-scores larger than 1 is 1-84.1% = 15.9%.