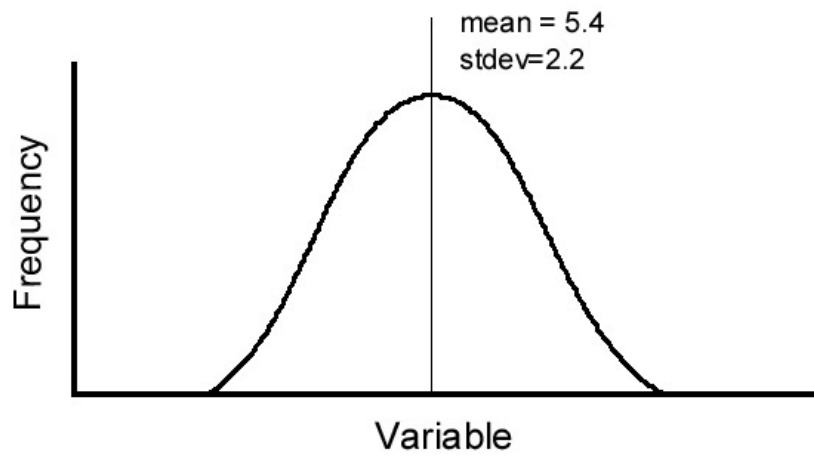


**Example 4**  
**Z-score**  
**(Proportions of normal curve)**

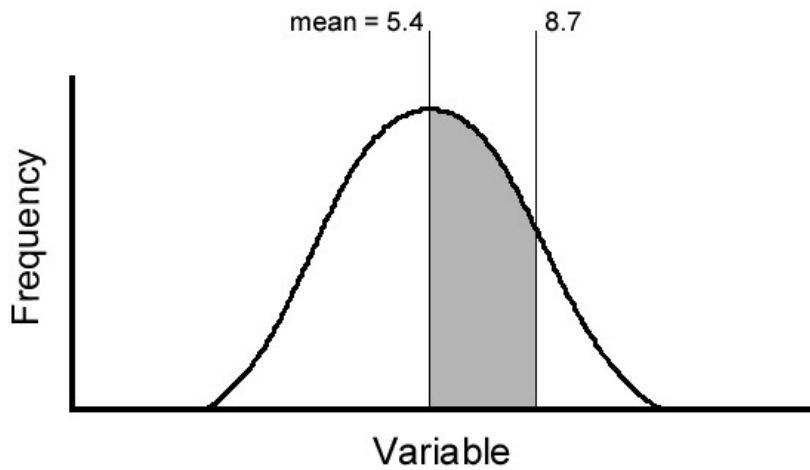
Data: Normal Distribution

$$\mu = 5.4$$

$$\sigma = 2.2$$



What proportion of the distribution is between the mean and 8.7?



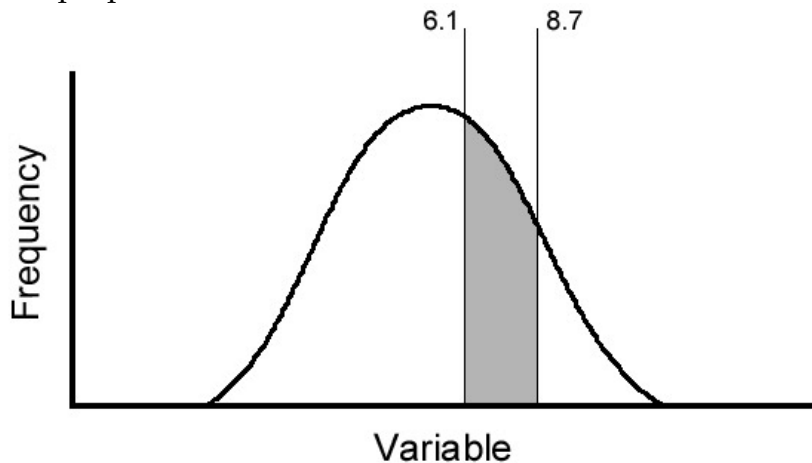
$$Z = \frac{X_i - \mu}{\sigma}$$

$$Z = \frac{X_i - \mu}{\sigma} = \frac{8.7 - 5.4}{2.2} = 1.50$$

Go to Table A. In the first column, find "1.5." Move across that row until you intersect the column labeled with "0" (the 0 comes from the 0 in 1.50) You should find the value 0.4332.

43.32% of the distribution lies between the mean and 8.7.

What proportion of the distribution is between 6.1 and 8.7?



Break this question into two parts.

What proportion of the distribution is between the mean and 6.1?

AND

What proportion of the distribution is between the mean and 8.7?

The second question we answered above (0.4332).

$$Z = \frac{X_i - \mu}{\sigma}$$

$$Z = \frac{X_i - \mu}{\sigma} = \frac{6.1 - 5.4}{2.2} = 0.318$$

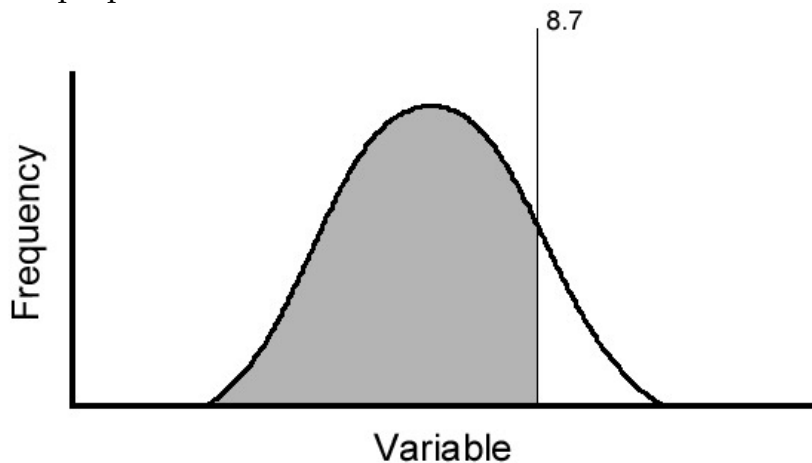
Go to Table A. In the first column, find "0.3." Move across that row until you intersect the column labeled with "0.02" (the 0.02 comes from rounding up the 0.018 in 0.318). You should find the value 0.1255.

Then subtract the proportion between the mean and 6.1 from the proportion between the mean and 8.7 and that is the proportion between 6.1 and 8.7.

$$0.4332 - 0.1255 = 0.3077$$

30.77% of the distribution lies between 6.1 and 8.7.

What proportion of the distribution is less than 8.7?



Break this question into two parts.

What proportion of the distribution is less than the mean?

**AND**

What proportion of the distribution is between the mean and 8.7?

The second question we answered above (0.4332).

Since normal curves are symmetrical 50% or 0.50 of the distribution is less than the mean.

Then add the proportion of the curve less than the mean and proportion of the curve between the mean and 8.7 and that will be the proportion of the distribution less than 8.7.

$$0.50 + 0.4332 = 0.9332$$

93.32% of the distribution is less than 8.7.

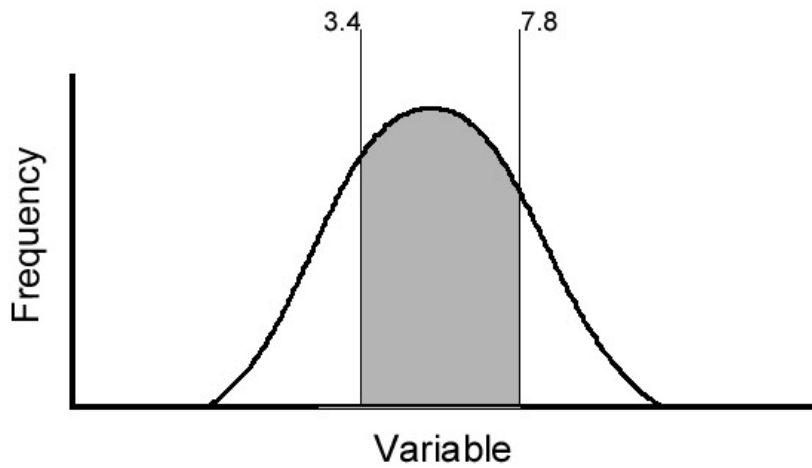
What if the question above had been "What proportion of the distribution is greater than 8.7?"

Half of the distribution (0.50) is greater than the mean and 0.4332 is between the mean and 8.7.

$$\text{Thus, } 0.50 - 0.4332 = 0.0668$$

6.68% of the distribution is greater than the 8.7.

What proportion of the distribution is between 3.4 and 7.8?



Try this problem on your own.

Remember everything is measured from the mean and that normal distributions are symmetrical.

THERE WILL LIKELY BE A PROBLEM LIKE THIS ON THE EXAM.