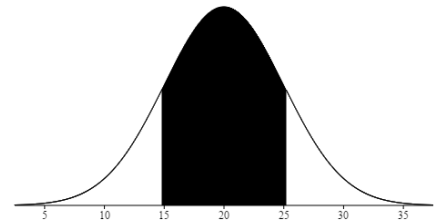


Assignment 3. Normal Curve: Answers.

1. Given a normal curve with a mean of 20 and a standard deviation of 5, find the two values of X that include the middle 70% of the distribution.

1. Since it's symmetric, let's focus on the right side; that's half of 70%, so 35%.
2. Enter Table B1 with 35.00, find $z=1.04$ (corresponds to 35.08 which is closest).
3. Find X values corresponding to $z=1.04$ and $z=-1.04$.
 $X=20+1.04*5=25.2$. $X=20-1.04*5=14.8$.

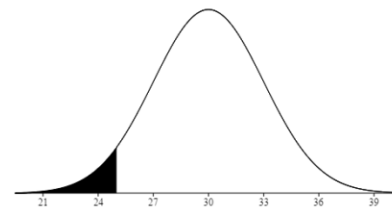


Answer: The two values of X that include the middle 70% of scores are 14.8 and 25.2.

2. Given a normal curve with a mean of 30 and a standard deviation of 3, find the percentage of scores below 25.

1. Calculate z-score: $z=(25-30)/3 = -1.67$
2. Enter Table B1 with $z=1.67$: find 45.25
3. That is the area between mean and 1.67; we need the other portion, so we subtract this result from 50: $50-45.25=4.75$.

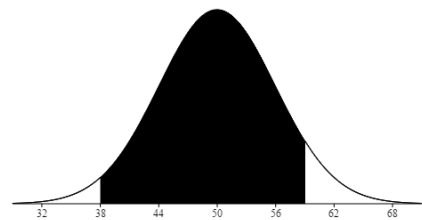
Answer: 4.75% of scores are below 25.



3. Given a normal curve with a mean of 50 and a standard deviation of 6, find the percentage of scores between 38 and 59.

1. Calculate z-scores. For 38: $z=(38-50)/6=-2$; for 59: $z=(59-50)/6=1.5$.
2. Enter table B1 with $z=2$: find 47.72. Enter table B1 with $z=1.5$: find 43.32.
3. Add these two areas: $47.72+43.32=91.04$

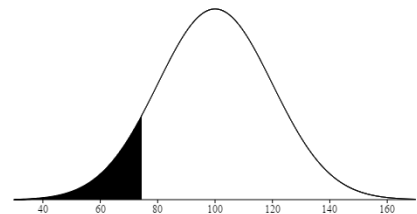
Answer: 91.04% of the scores are between 38 and 59.



4. Given a normal curve with a mean of 100 and a standard deviation of 20, find the X value such that only 10% of the cases are below it.

1. Since Table B1 shows the area between mean and a z-score, we use $50.00-10.00=40.00$ for the table.
2. Enter Table B1 with 40.00: find $z=1.28$ (corresponds to 39.97 which is the closest).
3. We need z-score on the left side, so we use negative value, -1.28, to get X: $X=100-1.28*20=74.4$.

Answer: 74.4 is the value that has only 10% of the cases below it.



5. Given a normal curve with a mean of 80 and a standard deviation of 10, find the percentage of scores between 85 and 105.

1. Calculate z-scores. For 85: $z=(85-80)/10=.5$. For 105: $(105-80)/10=2.5$.
2. Enter table B1 with $z=0.5$: find 19.15. Enter table B1 with $z=2.5$: find 49.38.
3. The area we need equals to the second of these areas minus the first, so we calculate: $49.38-19.15=30.23$.

Answer: 30.23% of scores are between 85 and 105.

