

Answer on Question #48468 – Math – Statistics and Probability

In a power lifting competition the distribution of total weight lifted has a mean of 1,100 pounds with a standard deviation of 20 pounds. What is the cutoff of total weight lifted for a competitor to finish in the bottom 30% of the competition?

Solution

We know that

$$P(X > X_{\text{cutoff}}) = P(z > z_{\text{cutoff}}) = 1 - P(z < z_{\text{cutoff}}) = 0.3 \rightarrow P(z < z_{\text{cutoff}}) = 0.7.$$

From z-table we know

$$P(z < 0.52) = 0.6985 \text{ and } P(z < 0.53) = 0.7019.$$

Interpolating between these points, we get

$$z_{\text{cutoff}} = 0.52 + \frac{0.7 - 0.6985}{0.7019 - 0.6985} (0.53 - 0.52) = 0.524.$$

The cutoff of total weight is

$$X_{\text{cutoff}} = \mu + z_{\text{cutoff}} \cdot \sigma = 1100 + 0.524 \cdot 20 = 1110.5 \text{ pounds.}$$

Answer: 1110.5 pounds.