

Answer on Question #80321 – Math – Statistics and Probability

Question

Mandy has an IQ of 115. We know that the mean (\bar{x}) IQ is 100 with a standard deviation of 15. There are 100 people in Mandy's Alcoholics Anonymous meeting. Taken at random, how many members are smarter than Mandy? How many people are not as smart as Mandy? How many members have an IQ between 125 and 135?

Solution

$$X \sim N(100, 15)$$

1. How many members are smarter than Mandy?

$$P(X > 115) = P\left(Z > \frac{115 - 100}{15}\right) = P(Z > 1) = 0.15866$$

$$N = 100 * 0.15866 = 16$$

Answer: there are 16 people smarter than Mandy.

2. How many people are not as smart as Mandy?

$$N = 100 - 16 - 1 = 83. \text{ We subtracted 1, because this is Mandy herself.}$$

Answer: there are 83 people.

3. How many members have an IQ between 125 and 135?

$$\begin{aligned} P(125 < X < 135) &= P\left(\frac{125 - 100}{15} < Z < \frac{135 - 100}{15}\right) = P(1.6667 < Z < 2.3333) = \\ &= 0.9901 - 0.9525 = 0.0376 \end{aligned}$$

$$N = 100 * 0.0376 = 4$$

Answer: 4 members have an IQ between 125 and 135.