

Answer on Question #79281 – Math – Statistics and Probability

Almost all medical schools in the United States require applicants to take the Medical College Admission Test (MCAT). On one exam, the scores of all applicants on the biological sciences part of the MCAT were approximately Normal with mean 9.7 and standard deviation 2.1. For applicants who actually entered medical school, the mean score was 10.6 and the standard deviation was 1.4.

Question

(a) What percent of all applicants had scores higher than 13?

Solution

We have the normal distribution $X \sim N(9.7, 2.1^2)$. Then

$$z = \frac{x-\mu}{\sigma}; \quad \frac{13-9.7}{2.1} \approx 1.5714;$$

$P(X > 13) = 1 - P(X \leq 13) = 1 - P\left(z \leq \frac{13-9.7}{2.1}\right) = 1 - 0.9418 = 0.0582$, that is, 5.8 % .

Question

(b) What percent of those who entered medical school had scores between 10 and 12?

Solution

We have the normal distribution $X \sim N(10.6, 1.4^2)$. Then

$$z = \frac{x-\mu}{\sigma};$$

$P(10 \leq X \leq 12) = P\left(\frac{10 - 10.6}{1.4} \leq X \leq \frac{12 - 10.6}{1.4}\right) =$
 $= P\left(z \leq \frac{12-10.6}{1.4}\right) - P\left(z \leq \frac{10-10.6}{1.4}\right) = 0.84134 - 0.33693 = 0.50441$, that is, 50.4 % .