

Answer on question 34077 – Math – Statistics and Probability

How do I calculate distribution of scores when $x=75$, $\text{std} = 6.38$ what is probability of score falling between a raw score of 70 and 80.

Answer:

It depends on the law of distribution of the scores. Most likely it is the normal distribution, then the distribution function is

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-a)^2}{2\sigma^2}} = \frac{1}{6.38\sqrt{2\pi}} e^{-\frac{(x-75)^2}{81.4088}}.$$

And the probability of score falling between a raw score of 70 and 80 is

$$P(70 < x < 80) = \Phi\left(\frac{80 - 75}{6.38}\right) - \Phi\left(\frac{70 - 75}{6.38}\right) = 2\Phi\left(\frac{5}{6.38}\right) \approx 0.5646$$

The value of $\Phi(0.78)$ we take from the table

<http://www.mathsisfun.com/data/standard-normal-distribution-table.html>