

Answer on Question #72466 - Math / Statistics and Probability

Let X represent the weight in pounds of king salmon caught at the mouth of certain river and assume that X possesses a normal distribution with mean 30 and standard deviation 6. Calculate the probability that if a fisherman catches a salmon its weight will be:

- a) At least 41 pounds
- b) Between 20 and 40 pounds

Solution:

The distribution function X has the form

$$F_X(x) = \frac{1}{\sqrt{2\pi} \cdot 6} \int_{-\infty}^x e^{-\frac{(s-30)^2}{72}} ds,$$

and

$$P\{a \leq X \leq b\} = F_X(b) - F_X(a).$$

- a) $P\{X \geq 41\} = 1 - F_X(41) = 0.033 = 3.3\%$
- b) $P\{20 \leq X \leq 40\} = F_X(40) - F_X(20) = 0.904 = 90.4\%$

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