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Volume 4, Number 4, April 2018

Group 5: mathematics

Decoding probability distributions

1

a $X = height\ of\ a\ pilot, X \sim N(175, 13^2), P(X < a) = 0.05, a = 154cm$. This is 21cm from the mean, so upper bound is 175+21 = 196. So 90% range is 154-196cm.

b $X = \#\ of\ average\ characteristics, X \sim B(10, 0.9), P(X = 10) = 0.387$

2

a $X = \#\ of\ defective\ screens, X \sim B(425, \frac{7}{1000}), P(X \geq 1) = 1 - P(X = 0) = 0.949$

b $X = \#\ of\ defective\ screens, P(X \geq 3 | X \geq 1) = \frac{P(1 \leq X \leq 3)}{P(X \geq 1)}$. The numerator can be calculated by adding probabilities for 1, 2, and 3, and the denominator was found in (a). Solution is $\frac{0.602}{0.949} = 0.634$.