Name : Sep 28, 2004

Sta113 HW Quiz 3

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1. [Ex 3.105, 3.85] A reservation service employs five information operators who receive requests for information independent of one another, each according to a Poisson process. Suppose the mean time between requests for one operator is 30 seconds.

a. What is the probability that during a given 1-min period, the operator receives no requests?

$e^{-2} = 0.1353$ (same as solution to ex 3.105(a))

b. Let Y = the number of operators (among the five) who receive no requests during a given 1-min period. What is the distribution of Y (specify the *name* and the *parameters* of the distribution)?

Y is distributed as Binomial with $n = 5$ and $p = 0.1353$

2. [Ex 4.339(d)] Suppose the diameter of trees of certain type is normally distributed with $\mu = 8.8$ and $\sigma = 2.8$. Define a value c such that the interval $(8.8 - c, 8.8 + c)$ includes 98% of all diameter values. So

$$\Phi(-\frac{c}{2.8}) = 0.01$$

3. [Ex 4.44] Express the following probability by using $\Phi(.55)$ and $\Phi(1.72)$.

$$P(-1.72 \leq Z \leq -.55) = \Phi(1.72) - \Phi(.55)$$

4. [Ex 4.51] $X \sim Bino(n = 500, p = 0.4)$ with $\mu_x = 200$ and $\sigma_x = 10.95$. What is the probability that X is more than 175, i.e. $P(X > 175)$? (Circle the correct answer.)

A. $\Phi(\frac{175+0.5-200}{10.95})$

B. $1 - \Phi(\frac{175+0.5-200}{10.95})$

C. $\Phi(\frac{175-0.5-200}{10.95})$

D. $1 - \Phi(\frac{175-0.5-200}{10.95})$

$P(X > 175) = 1 - P(X \leq 175)$, so **B**.