Math 250-A02 **Winter 2006** **Guide for Test 4**

The fourth test is in class on Friday 3 March.
Here are some sample questions, so that you have an idea of what to expect.

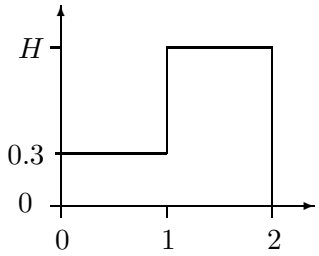
1. (a) Let Z be a standard normal random variable. Using the table, compute:
   i. $P[Z < -0.95] =$
   ii. $P[Z \geq 1.42] =$
   iii. The 90-th percentile of Z.

   (b) Let X be a random variable distributed as $N(7, 5)$.
   Compute $P[X \leq 8]$.

   (c) Let X be a binomial random variable with $n = 100$ and $p = 0.7$.
   Estimate $P[60 \leq X \leq 65]$ using the standard normal table.

2. The height of male US college students is normally distributed with mean 67 inches and standard deviation 3 inches. If a sportscar manufacturer wants the seats to fit the middle 70% of these students, then what range of heights should they target?

3. The probability density function $f(x)$ for the random variable X is given by the graph on the right.



   (a) Find the value of H that makes $f(x)$ a legal probability density function.

   (b) Find the median.

4. A large population is described by the probability distribution on the right. Let X_1, X_2 be a random sample of size 2 from this distribution.

x	$f(x)$
2	.2
4	.3
6	.5

   (a) In the following table, list the possible samples, their probabilities, and their means.

(x_1, x_2)	probability	$\bar{x}$

   (b) In the following table, give the sampling distribution of $\bar{x}$.

$\bar{x}$	$f(\bar{x})$

   (c) Compute the expectation of $\bar{x}$.