Quiz 5
Math 124
March 6, 2009

1. You have a spinner with the values 1, 2, 4, and 5, and it takes those values with equal probability. Let $X$ be the value of a spin.

(a) Compute $E(X)$.

$$E(X) = 1(\frac{1}{4}) + 2(\frac{1}{4}) + 4(\frac{1}{4}) + 5(\frac{1}{4}) = \frac{12}{4} = 3$$

(b) Compute the variance of $X$.

$$\text{Var}(X) = (1-3)^2 \frac{1}{4} + (2-3)^2 \frac{1}{4} + (4-3)^2 \frac{1}{4} + (5-3)^2 \frac{1}{4}$$

$$= \frac{4}{4} + \frac{1}{4} + \frac{1}{4} + \frac{4}{4} = \frac{10}{4} = 2.5$$

(c) Compute the standard deviation of $X$.

$$\sigma = \sqrt{2.5}$$
2. If $X$ is a normal random variable with mean $\mu = 1$ and standard deviation $\sigma = .5$, find the probability that $X$ is between 1 and 1.5, that is, $P(1 \leq X \leq 1.5)$. (Use the attached table.)

\[
P(1 \leq X \leq 1.5)
= P\left(\frac{1-1}{.5} \leq Z \leq \frac{1.5-1}{.5}\right)
= P(0 \leq Z \leq \frac{.5}{.5})
= P(0 \leq Z \leq 1)
= P(Z \leq 1) - P(Z \leq 0)
= .8413 - .5000 = .3413
\]