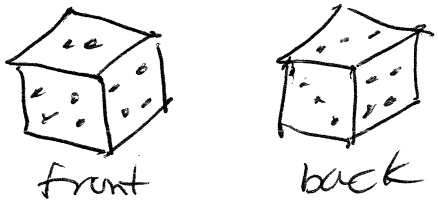
Math 461
HW3
Due 9/16/09

1. A number X is chosen uniformly from the interval $[1, 16]$. Let $Y = \sqrt{X}$

(a) Compute $P(Y \leq 2)$

(b) Sketch the cdf (cumulative distribution function) of Y

2. A weird cubic die has "2" on one face, "3" on two faces and "4" on three faces



(a) Let X be the result of rolling the die once.
Determine $E(X)$ and $\mathrm{Var}(X)$

(b) The die is rolled twice, independently, the sum is Y
Determine the frequences for Y

(c) Let $A = \{$first roll is odd$\}$, $B = \{$sum of two rolls is odd$\}$
Determine $P(A)$, $P(B)$, $P(A|B)$, $P(B|A)$, $P(A \cap B)$
Are A + B independent?

3. Suppose X and Y are independent random variables on a probability model, and $P(X=0) = .6$, $P(X=1) = .4$, $P(Y=0) = .3$ $P(Y=1) = .7$. Let $Z = X + Y$.

(a) Sketch the cdf of Z

(b) Compute $E(Z)$ and $\mathrm{Var}(Z)$ by any correct method