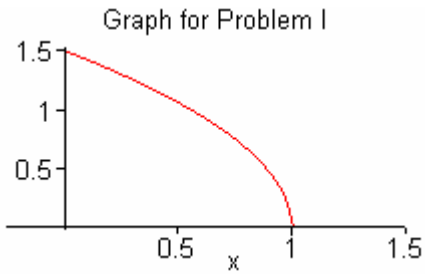
11/10/2004 MA371 Intro. To Prob. & Stats. Name:_____
Dr. Lunsford Quiz 5 (20 Points Total)

I. Suppose the random variable $X$ has the probability density function $f(x)=\frac{3}{2}\sqrt{1-x}$ for $0\le x\le 1$.

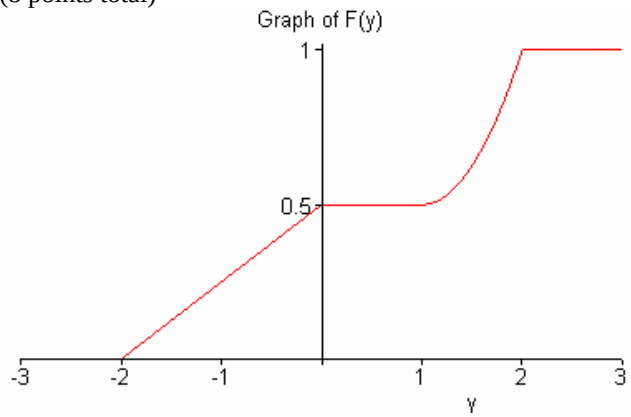
A graph of the p.d.f. is given below. Please answer the following:



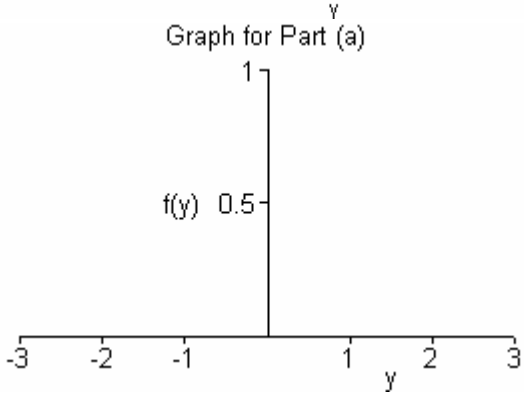

(a) Find $P\left(0\le X\le \frac{3}{4}\right)$ and represent this probability on the graph. (6 points)

II. Suppose the random variable $Y$ has the cumulative distribution function $F$ given below. You are also given a graph of the c.d.f. Please answer the following: (8 points total)

$$F(y)=\begin{cases}0, & y\le -2\\ \frac{1}{4}y+\frac{1}{2}, & -2\le y\le 0\\ \frac{1}{2}, & 0\le y\le 1\\ \frac{1}{2}y^2-y+1, & 1\le y\le 2\\ 1, & y\ge 2\end{cases}$$




(a) Find the probability density function, $f(y)$, for $Y$ and graph it on the axes provided below. (5 points)




(b) <u>Graphically represent</u> (but DO NOT FIND!) the value of $P\left(-1\le Y\le \frac{5}{2}\right)$ on the graphs of both the c.d.f. and the p.d.f. for $Y$. (3 points)

III. A discrete random variable, say $X$, has the moment generating function $M(t)=\frac{1}{4}+\frac{3}{8}e^{t}+\frac{1}{8}e^{2t}+\frac{1}{4}e^{3t}$. Find $P(X=2)$ and $E[X]$. Clearly indicate your answers. (6 points)