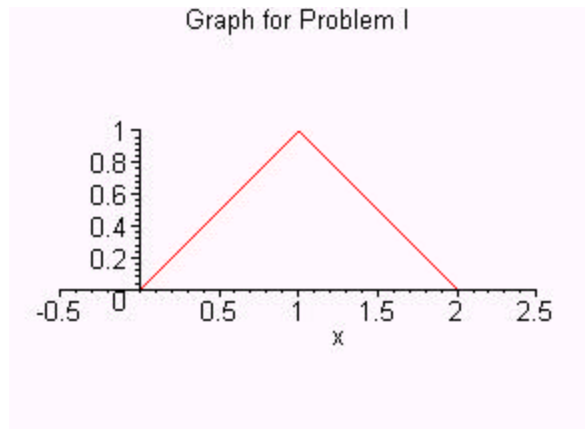I. Let X be a random variable with p.m.f given by $f(x) = \begin{cases} x, & 0 \le x < 1 \\ 2 - x, & 1 \le x < 2 \\ 0, & elsewhere \end{cases}$. A graph of the

p.m.f is given below. Please answer the following. (16 points total)

(a) Show the probability $P(\frac{1}{2} \le X \le \frac{3}{2})$ graphically

on the graph to your right. (2 points)

(b) Use basic geometry to find $P(\frac{1}{2} \le X \le \frac{3}{2})$.

Clearly show your work. (3 points)

Graph for Problem I

(c) Compute $P(\frac{1}{2} \le X \le \frac{3}{2})$ by using the p.m.f. (5 points)

(d) Find the cumulative distribution function, $F(x)$, for the random variable X. (5 points)

(e) Find m_X. (5 points)