An insurance company offers its policyholders a number of different premium payment options. For a randomly selected policyholder, let $X =$ the number of months between successive payments. The cdf is as follows:

$$F(x) = \begin{cases} 0 & x < 1 \\ 0.25 & 1 \leq x < 2 \\ 0.45 & 2 \leq x < 4 \\ 0.50 & 4 \leq x < 6 \\ 0.60 & 6 \leq x < 12 \\ 1.0 & 12 \leq x \end{cases}$$

. Compute the probabilities $P(1 \leq X < 6)$ and $P(X \geq 2)$.

(10 pts)

$P(1 \leq X < 6) = F(6^-) - F(1^-) = 0.5 - 0 = 0.5$ or

$P(1 \leq X < 6) = F(1) + p(2) + p(4) = (0.25-0) + (0.45-0.25) + (0.50-0.45) = 0.25 + 0.20 + 0.05 = 0.50$

$P(X \geq 2) = 1 - F(2^-) = 1 - 0.25 = 0.75$ or

$P(X \geq 2) = 1 - P(X < 2) = 1 - P(X \leq 1) = 1 - F(1) = 1 - 0.25 = 0.75$ or

$P(X \geq 2) = p(2) + p(4) + p(6) + p(12) = 0.20 + 0.05 + (0.6 - 0.5) + (1.0 - 0.6) = 0.25 + 0.10 + 0.40 = 0.75$. 