

Ground Rules: Time allowed is 20 minutes, individual work only and closed book test.

Your name _____
 Sample Solution

Score :

1. Let $X \sim \text{Uniform}[0, 30]$. Let $Y = \min(X, 3)$. Find the distribution function of Y .

Distribution function of Y is given by
 $F_Y(y) = P[Y \leq y]$

(Given $Y = \min(X, 3)$)

New $P[Y \leq y] = 1 - P[Y > y]$

$= 1 - P[\min(X, 3) > y]$

For $y \geq 3$, since $\min(X, 3) \leq 3$,
 $P[\min(X, 3) > y] = 0$

For $y \in [0, 3)$, $P[\min(X, 3) > y] = P[X > y] = \frac{30-y}{30}$

{ Since X is uniform RV on $[0, 30]$

For $y > 0$, $P[\min(X, 3) > y] = P[X > y] = 1$ since $P[X \geq 0] = 1$

So $F_Y(y) = \begin{cases} 1 & \text{for } y \geq 3 \\ \frac{30-y}{30} & \text{for } 0 \leq y < 3 \\ 0 & \text{for } y < 0 \end{cases}$

□