77. Solution: D

Prob. = $1-\int_1^2\int_1^2 \frac{1}{8}(x+y)dxdy = 0.625$

Note

$\Pr\left[(X \le 1)\cup(Y \le 1)\right] = \Pr\left\{\left[(X>1)\cap(Y>1)\right]^c\right\}$ (De Morgan's Law)

$$= 1-\Pr\left[(X>1)\cap(Y>1)\right] \quad = 1-\int_1^2\int_1^2 \frac{1}{8}(x+y)\,dxdy \quad = 1-\frac{1}{8}\int_1^2 \frac{1}{2}(x+y)^2\Big|_1^2\,dy$$

$$= 1-\frac{1}{16}\int_1^2\left[(y+2)^2-(y+1)^2\right]dy \quad = 1-\frac{1}{48}\left[(y+2)^3-(y+1)^3\right]\Big|_1^2 = 1-\frac{1}{48}(64-27-27+8)$$

$$= 1-\frac{18}{48} = \frac{30}{48} = 0.625$$