Probability homework 3.

① $P(X<=0.5) = 0.2 + 0.2 + 0.1 = 0.5$

$P(0.25 < X < 0.75) = 0.2 + 0.2 = 0.4$

② find $E(X) = (0 \times 0.1) + (1 \times 0.4 \ldots = 1,6$

② $Var(X) = (0-1,6)^2 \cdot 0.1 + (1-1,6)^2 \cdot 0.4 + (2-1,6)^2 \cdot 0.3$

$= 0,84$ ✻

or using $var(X) = E(X^2) - (E(X))^2$

$E(X^2) = (0^2 \times 0.1) + (1^2 \times 0.4) + (2^2 \times 0.3) + \ldots\ldots$

$= 3,4$

$\therefore var(X) = 3,4 - (1,6)^2 = 0,84$ ✻

③ if $y = (X-2)^2$ find $E(y)$

$\therefore E(y) = E(\ldots)$ سنحسبها كدوق

$\therefore E(y) = E(X^2 - 4X + 4) = E(X^2) - 4E(X) + 4$

$= 3,4 - 4(1,6) + 4 = 1,0$ ✻

③ $var(2X-y) = 6$, $var(X+2y) = 9$

$\therefore 4var(X) + var(y) = 6 \Leftarrow 4var(X) + (-1)^2 var(y) = 6$

$var(X) + 4Var(y) = 9$

$\therefore var(X) = 1$

$var(y) = 2$