RELATED RANDOM VARIABLES

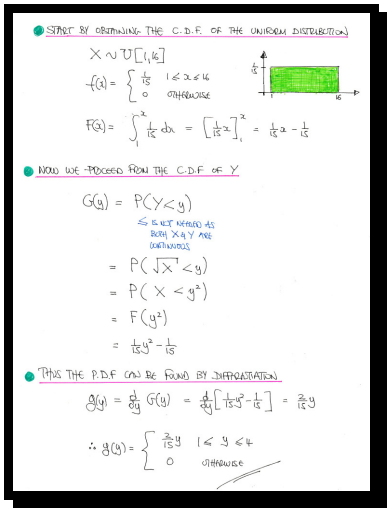
Question 1 (***)

The continuous random variable X is uniformly distributed in the interval $[1,16]$.

The continuous random variable Y is related to X by the equation $Y=\sqrt{X}$.

Determine the probability density function of Y.

$\square$, $\boxed{f(y)=\begin{cases}\frac{2}{15}y & 1<y<4\\ 0 & \text{otherwise}\end{cases}}$



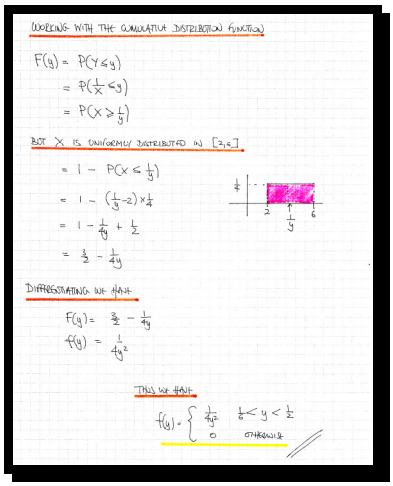
Question 2 (***)

The continuous random variable X is uniformly distributed in the interval $[2,6]$.

The continuous random variable Y is related to X by the equation $Y=\dfrac{1}{X}$.

Determine the probability density function of Y.

$\square$, $\boxed{f(y)=\begin{cases}\dfrac{1}{4y^2} & \dfrac{1}{6}<y<\dfrac{1}{2} \\ 0 & \text{otherwise}\end{cases}}$



Question 3 **(***+)**

The continuous random variable U is uniformly distributed in $[0,1]$.

The continuous random variable X satisfies

$$X=\frac{2}{2+13U}.$$

Determine the probability density function of X.

$\square$, $\boxed{f(x)=\begin{cases}\dfrac{2}{13x^2} & \dfrac{2}{15}<x<1\\ 0 & \text{otherwise}\end{cases}}$

