Proof that:

1- If $f\left(x\right)=\frac{1}{β}e^{\frac{-x}{β}};x>0, β>0$, then

$E\left(X\right)=β$, and $Var\left(X\right)=β^{2}$.

2- If $ f\left(x\right)=\frac{c}{\left(x+100\right)^{3}}, x>0.$

Find c.

3- If $ f\left(x\right)=k\sqrt{x}, 0<x<1.$

Find k.

4- If $f\left(x\right)=2\left(1-x\right), 0<x<1.$

Find $E\left(X\right)$.