Problem 102

X = lifetime of 1st generator
Y = lifetime of 2nd generator

$X \sim$ Exponential $(\theta = 10)$ since $E(X) = 10 = \theta$
$Y \sim$ Exponential $(\theta = 10)$

Strategy: Determine equation for total time
Determine relationship between 2 generators

2nd generator starts only after 1st fails
Total lifetime is lifetime of 1st generator plus lifetime of 2nd
Total time = $X + Y$

Assume X and Y are independent

$V(X+Y) = V(X) + V(Y)$ by independence
$= 10^2 + 10^2$ since $V(X) = \theta^2$
$= 200$

E