For part (a) ...  
  
Note that  
  
Pr(X>x) = 1-[Pr(X=0)+...+Pr(X=x)]  
  
= 1-(1/3)[(2/3)^0+...+(2/3)^x]  
  
Then apply the formula that it is given in the Hint.  
  
For part (b) ...  
  
Two approaches are suggested in the Hint.  
  
Let z\in{0,1,2,...}  
  
Pr(Z=z) = Pr(X=z,Y>z) + Pr(X>z,Y=z) + Pr(X=z,Y=z)  
  
Use the fact that X and Y are independent, which leads to   
Pr(X=z,Y>z)=Pr(X=z)Pr(Y>z).  
  
For Pr(X=z), use the formula for the prob. function for geometric   
distribution (from the book).  
  
For Pr(Y>z), use the formula from part (a).  
  
The terms Pr(X>z,Y=z) and Pr(X=z,Y=z) can be computed similarly.  
  
After some calculations, you will show that the prob. function of Z is   
the same as for Geometric(7/15).  
  
For part (c) ...  
  
What you need to calculate is E[min(X,Y) + 1], where X and Y are the   
same as in part (b). Use the result  
  
about the distribution of min(X,Y) from part (b). Apply the formula for   
the expectation of the geometric distribution (from the book).  
  
Hope this helps.