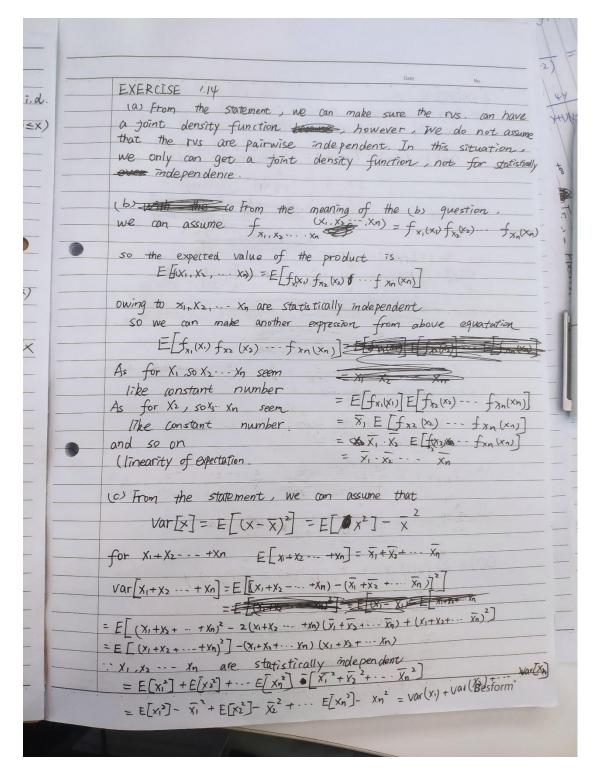
## Homework 2

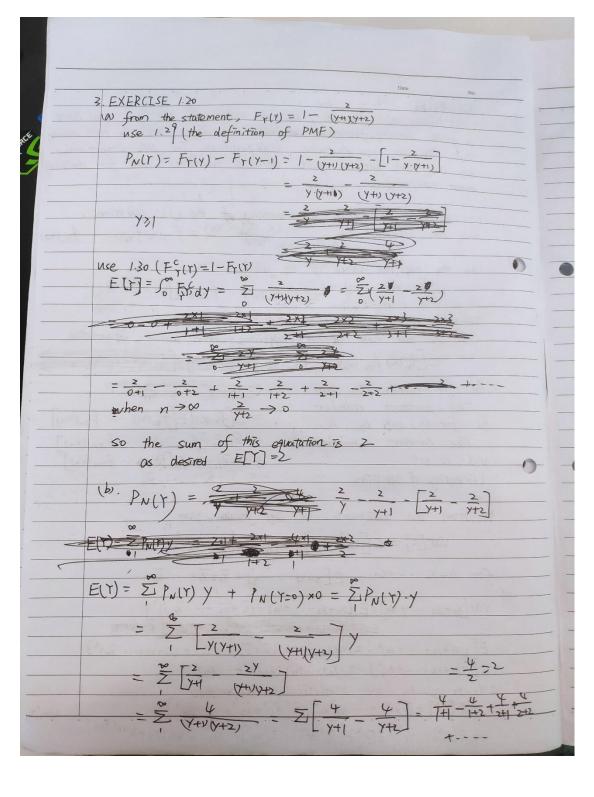
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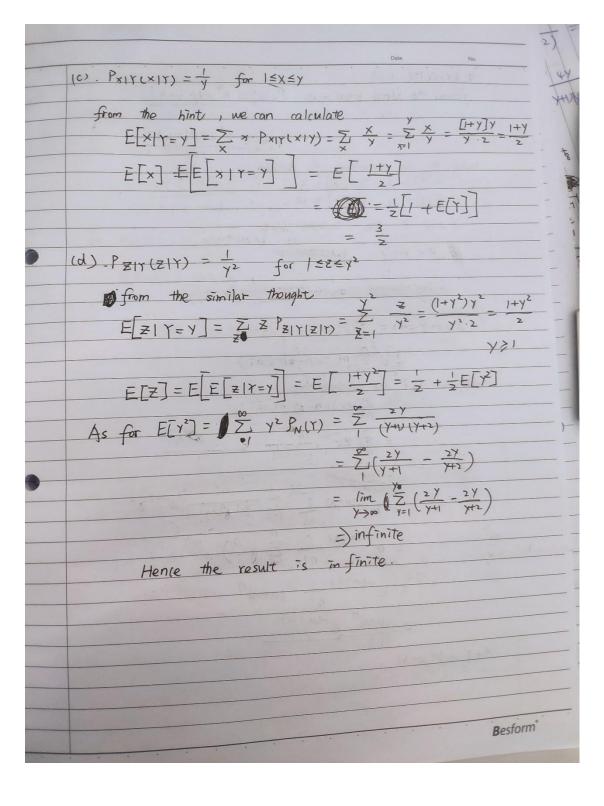
LUO ZIJIAN

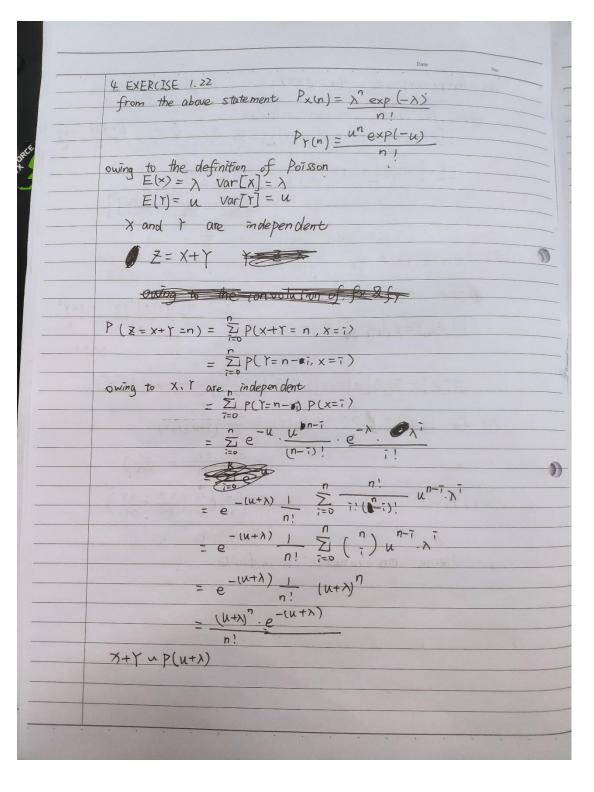
January 29, 2021

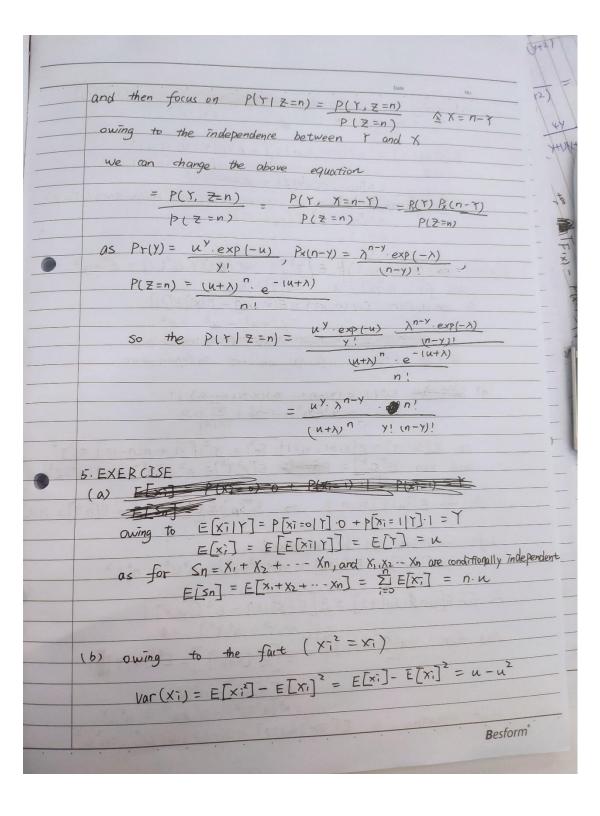
	Date No.
0	1. EXERCISE 1.12
	from the above statement, we can know the rvs. are T.T.
	then follow the instruction: Pr(M+=X1, R < r   X1=x) = II Pr(x-r <xj <<="" td=""></xj>
	As for the conditional probability.
	$Pr(M+=X_1, R \leq r) = Pr(M+=X_1, R \leq r   X_1=X) \cdot Pr(X_1=X)$
	$= \prod_{j=1}^{n} P_{r}(x-r < x_{j} < x_{j}) \cdot f_{x_{j}}(x_{j})$
	we can easily get the conclusion $(Pr(M+=x_1)=\frac{1}{n})$
	The to and number divide to number
14	$ \int \mathbb{D}(\mathbb{D}R \leq r) = \frac{\Pr(M + = X_1, R \leq r)}{\Pr(M + = X_1)} = \frac{n}{j=2} \Pr(X - r < X_j \leq x) \neq_X (M + x_1) $
311	- n Pr(x-r <xj=x)+,< td=""></xj=x)+,<>
	-1, ker / / / / / / / / / / / / / / / / / / /
	$\Pr\left(R \leq r\right) = \int_{-\infty}^{+\infty} \int_{M^{+} = X, R \leq r}^{+\infty} dx = \int_{-\infty}^{+\infty} n \frac{n}{j=2} \Pr(x - r < x_{j} \leq x) f_{x}(x)$
	7.41 0.3 -14
	owing to $Pr(x-r < xg \leq x) = F(x) - F(x-r)$
	so we can make another expression:
	$=\int_{-\infty}^{\infty} \int_{0}^{\pi} \left[F(x) - F(x-r)\right] f_{x(x)} dx$
	$= \int_{\infty}^{+\infty} n f_{x(x)} \left[ F(x) - F(x-r) \right]^{n-1} dx$
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(c) from above statement (ov (xi, xi) = E[Xi Xi] - E[Xi] E[Xi], for it]
       E[xixg|r] = 1xp[xi=1,xg=1|r] + 0 xp[xi=0,xj=1|r]
                                +0xp[xi=1,xj=0[r] +0xp[xi=0,xj=0[r]
                               = P[xi=1, xj=11]
                              = P[xi=1|Y] · P[xj=1|Y] (xi and x) are conditional independent
                               = r.z
= r.z
    60 E[xixi] = E[ME[xixj|Y]] = E[T] = Var[Y] + E[Y] = 62+42
    As for E[xi] = u E[xi] = u
   In conclusion (ov (xi, xz) = E[xi xz] - E[xi] E[xi]
                                                                            =6^2+u^2-u\cdot u=6^2
    because 62 >0, so Xi. Xi are not independent
(d) As for E[Var(sn1)] = E[E E E(sn21) - E2(sn1)] = E(sn) - E2(sn1)
      and for (Var[E[snit]] = E[E2[snit]] - E2[E[snit]]=E2(snit)-E2(sn)
             so E [Var(Sn/Y)] + var[E[Sn/Y)]
                 = E(sn) - E2(sn1) + E2 (sn1) - E2(sn)
                  = E(sn) - E2(sn)
             as desired
                 Var (Sn) = E(Sn) - E2(Sn) = E[Var (Sn/x)] + Var(E[Sn/x])
(e). by using the formula in part (d)
             Var (Sn) = E[Var (Sn/r)] + Var (E[Sn/r)]
                                      = 0 Var (5m)
                                     = E[ Var (x,+x,+...xn | r)] + Var (E[ x/+x+-+xn | r))
                                     = E[n. Var(xilY)] + Var(n.E(xilY)
                                  The Part of the Pa
                                   = n + 1 6 + n 6
                                  = nE[Var(xi| Y)] + n2 Var[E[xi| Y]]
                                  = n E[T(1-T)] + n2.62
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	Date No.	- 34/
	owing to $E[r] = u E[r^2] = 6^2 + u^2$	- der
		\
	So the expression can be a changed $= n E[Y - Y^2] + n^2 \cdot 6^2$ $= n E[Y] - n E[Y^2] + n^2 \cdot 6^2$	- #
	$= nE[Y-Y^2] + n^2 \cdot 6^2$	- 3
	$= nE[\Upsilon] - nE[\Upsilon^2] + n^2 6$	3
	$= n \cdot u - n \left( u^2 + b^2 \right) + n^2 b^2$	
	$= n \cdot u - n(u^{2} + b^{2}) + n^{2} b^{2}$ $= n(u - u^{2}) + (n^{2} - n) b^{2}$	
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