STAC62F: 2016 Assignment (4) - Solutions 1) Latting on = P(Sn=N for some n and 5, 5-, 5n-1 \$0 | So=k) we have. 912 = P9 et + 992-1 which has & duting

912 = 1 and 912 = (410) 12 subject to

The poweral solutions 90 = 0 990 = 1

The general solution is of the form A+B(9) 12

For some A, BER. Then from the boundary

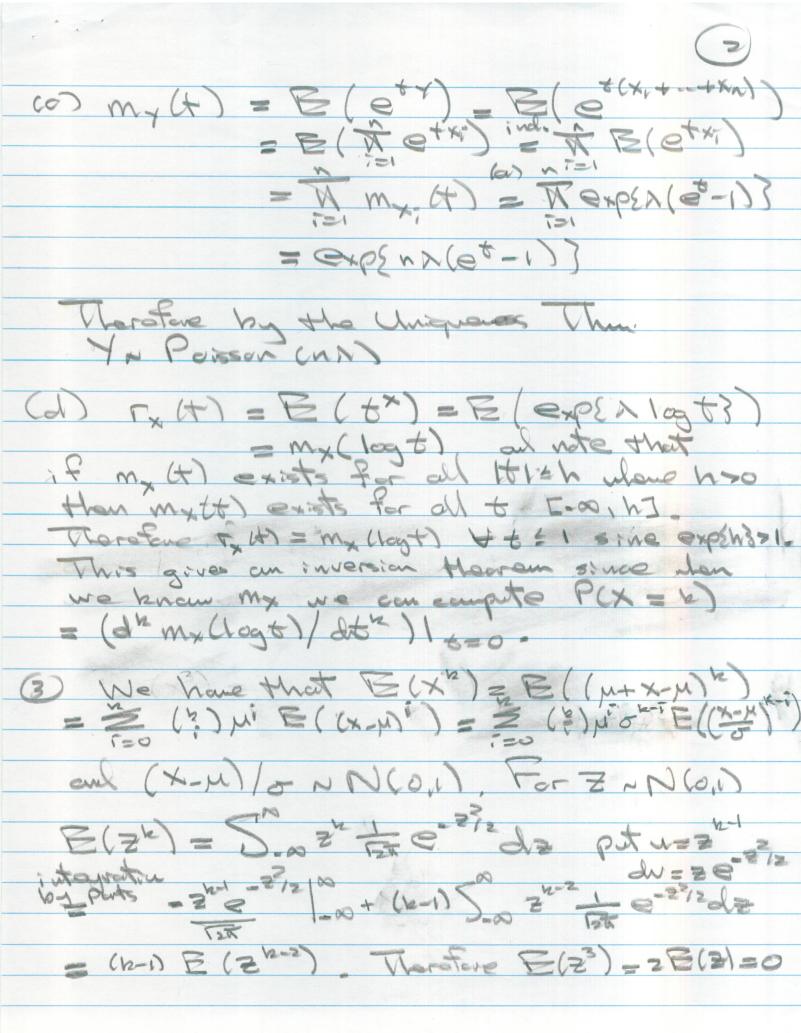
conditions A and B must solvisty 0 = A+B and

1 = A+B(910) N ST 1 = B(7910) N 17 N= A+B(91P)N 50 1= B[91P)N-1] which requires $q \pm p$. Therefore, $q_R = 1 - (q_1p)^2$, Ilon $q \pm p$. $1 - (q_1p)^N$ When 9=P, 9n = 1/m 1-an = 1/m - kated = 2 (a) Suppose X ~ Poisson (A) Hom my (t)

= E (etx) = 2 etx x e-x/si

-e-x 2 (xet) / 2i = exp { x (et -1) } and

this holds for all to ER. (6) E(X) = dmx(+) | = = xetexp{x(et-1)} | 6=0 Therefore Van(x) = E(x)-E(x))= 1.



(3)

E(z4) = 3 E(z2) = 3.1 = 3, E(z3) = HE(2) =0, E(26) = 5 E(z4) = 5.3 = 16. Therefere 7 has mean E(Y)= = (3) NO 5 E(Z)-1) = (3) mo -3 .0 + (3) mo -1+ (3) mo .0 + (3) mo -1 = 3 mo + m3 al Var (7) = + Var(4) = + (E(72)-(E(4))2) B(42)= E(x6)= Z(6) pro6-i E(Z6-i) = 06.15 + (6) prot-3+ (6) prot-1+ (6) pro = 1506+ 45 mo+ + 15 mo+ m6 Therefore by the CLT 7- (3μσ²+μ³) DN (0,1) as n -D 00. This implies P (73k)

2 0 (b-(3μο²+μ³)

2 1506+45μ²σ²+μ5μ²σ²+μ6)