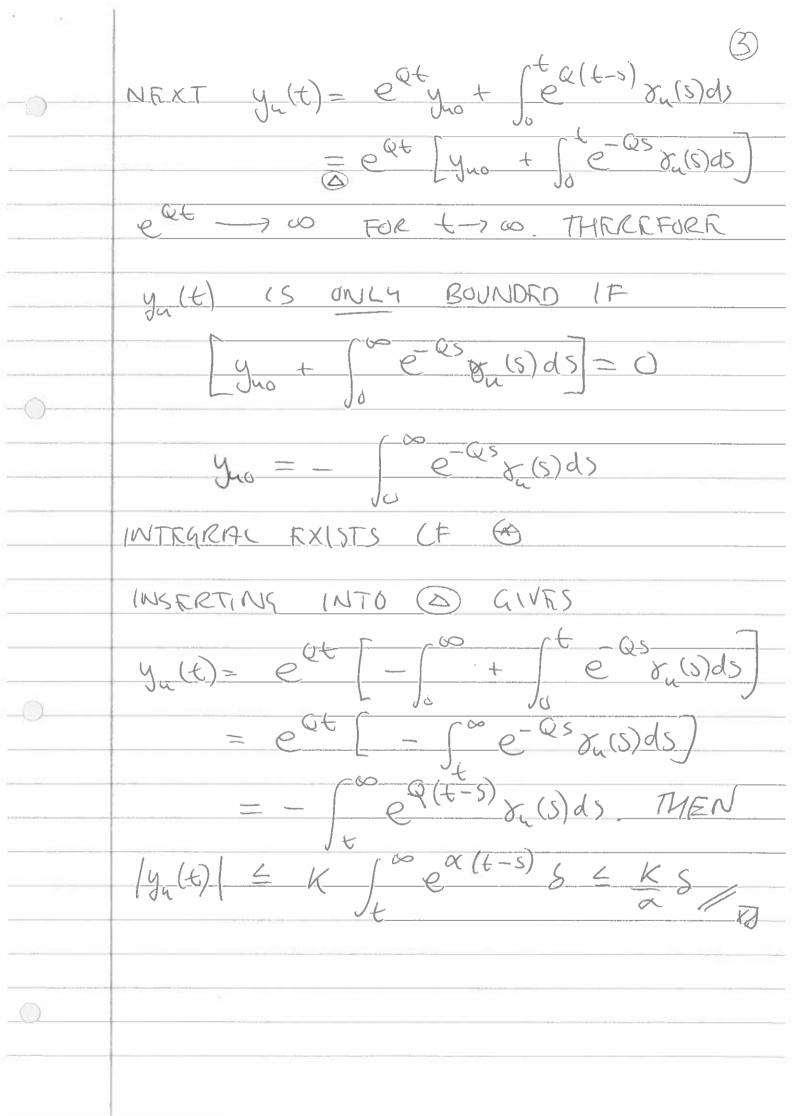
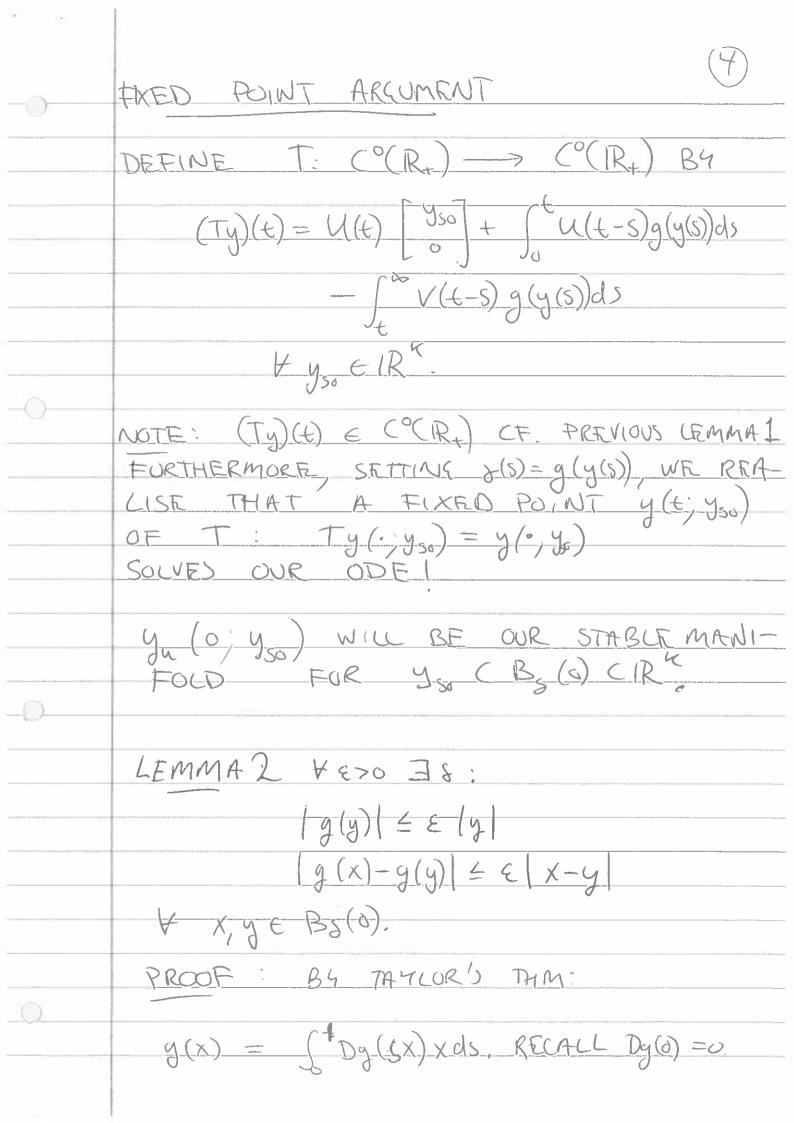


LEMMA 1 y = By + &(t). SUPPOSE &(t) CONTINUOUS AND BOUNDED | 2(t) | < & FOR + ≥0. THEN Y Y EIR F! y(t; y; o) SOLUTION WHICH IS BOUNDED FOR ACC. EZO: y(t; yso) = U(t) | yso | t (u(t-s) x(s) ds $-\int_{1}^{\infty}V(+-s)\,\delta(s)ds$ PROOF: LET y(t) = eBt S(t). THEN §(+) = e Bt 2(+), HENCE. 3(t) = 5(0) + (+ = 35 x(s)ds so THAT y(t) = eBty(0) + (teB(t-s))(s)ds. y₅(t) = e^{pt} y₅ + (te^B(t-5) x₁s)ds WHICH IS BOUNDED: 145(t) 15 Ke-at 1450 + (Ke-a(t-s) 5ds < Ke-at 14) + K8 < 60

U51NG X





0	HENCE YR 78: Dg(x) < & XEBs(0)
	1g(x)1 ≤ SUP Dg(x) 1 X ≤ € X)
	$\frac{S(M)(ARLY)}{g(x)-g(y)} = \int_0^1 Dg(y+S(x-y))(x-y)dy$
	$= \frac{1}{9}(x) - \frac{9}{9}(y) \leq \frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right) = \frac{1}{2}$
0	$\angle E + W = 2y \in (^{\circ}(\mathbb{R}_{+}) 1y(t) \leq 5$
	W IS CLOSFED.
	LEMMA 3 T:W ->W /F
	1950 / C 5/2K, E = 9/4K (D)
O	PROF:
18 0011	$ Ty(t) \leq Ke^{-t\alpha} y_0 + K = \int_0^t e^{-(t-s)} y_0 ds$
	USING LEMMA 2 + Je e = siny with
	THERREDER FOR y (t) E W:
)	(ty)(t) = Ke-tx/yso + K & 28
	E & USING (1)

GMMA 4: SUPPOSE (D) THEN T: W-TW IS A CONTRACTION. PROOF: ESTIMATION GIVES: |(T(x)-T(y)) = K& 1/x-y1) $\int_{0}^{t} e^{-(t-s)x} ds + \int_{0}^{\infty} e^{(t-s)x} ds$ < //x-4/1. B BY BANACH'S FIXED POINT THEOREM FIXED POINT OF TINW. y (0; ys.) 13 OUR S. 1+ 15 AGRAPH IT IS FAST TO SHOW THAT Y(0, ys.)
IS INVARIANT. ALSO USING GROWALL'S INFRUAUTY IT LAN BE SHOWN THAT (y(t; yso) (\(\)