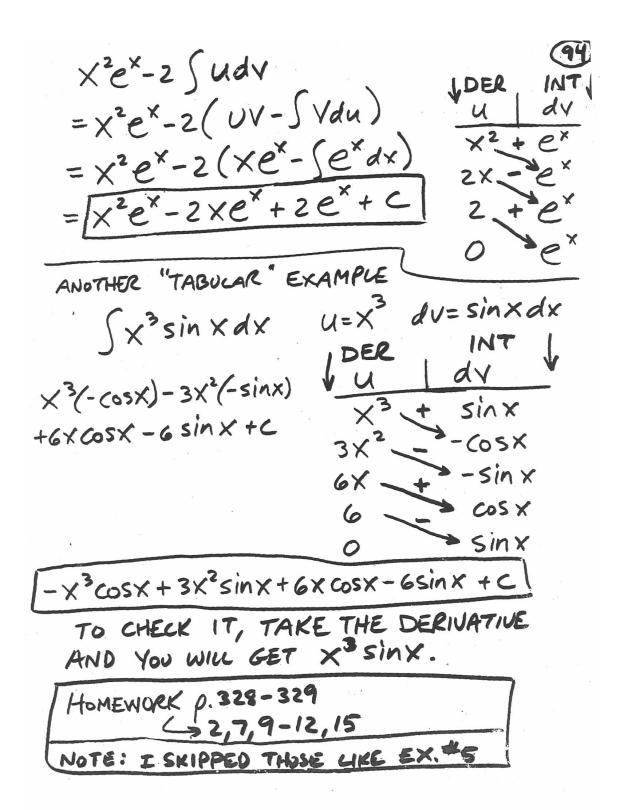
6.3 INTEGRATION BY PARTS 92 d (UV) = U dv + V du IN DIFFERENTIAL d(UV)=UdV+Vdu FORM OR UdV = d(UV) - Vdu BOTH SIDES SUDV = Sd(UV) - SVdu Sudv= UV-Svdu EX.1 p. 324 SXCOSXdX Ju=X du=dx V= sin x EX.1 p. 324 SudV=UV-SVdu = X. sinx- Ssinx dx $= \times \cdot \sin x - -\cos x + C$ =Xsinx+cosx+C/ CHECK BY TAKING DERIVATIVE d (xsinx+cosx+c)

= X cos x + sin x(1) + - sin x + 0 = X cos x u dx + v dx

6.3 CONTINUED (INTEGRATION BY PARTS)
REMEMBER [SUdy = UV-SVdu] GEXAMPLE SIN'X dX U=SIN'X dV=dX $\int u dv = UV - \int V du \qquad du = \frac{1}{\sqrt{1-\chi^2}} dx \quad V = \chi$ $= \left(\sin^{-1}x\right) \times - \int \times \frac{1}{\sqrt{1-x^2}} dx$ = $\times \sin^{1} x + \frac{1}{2} \int \frac{-2 \times 1}{(1-x^{2})^{\frac{1}{2}}} dx$ "NEW U $u = 1-x^{2}$ = $\times \sin^{2} x + \frac{1}{2} \int (1-x^{2})^{-\frac{1}{2}} (-2xdx) du = -2xdx$ = x sin'x+ = 5 u du = x sin'x+ = u + c -1,3,4,5,8 = Xsin x+ 1-x2 +C EX. 4 P.326 TABULAR INTEGRATION Sx2exdx u=x2 dv=exdx du=2xdx V=ex Sudy=uv-[Vdu = x2ex-Sex(2xdx) NEW U, V etc ... u=x dv=exdx = x2ex-2(xexdx du=dx V=ex



POPULATION 3.5

95

CURRENTLY POPULATION DOUBLES EVISEY SO YEARS.

THE CURRENT POPULATION IS ABOUT 6.3 BILLION.

6,300,000,000 t- JAN. 1,2004

HOW LONG WOULD IT TAKE 8 PEOPLE, DOUBLING EVERY SO YEARS TO REACH 6,300,000,000?

P=Poekt a Z=esok k= Ins 50

16=8 ekso sinz=sok k=.013863

6,300,000,000=80:013863t

6,300,000,000=0:013863t

787,500,000=0:013863t

IN 787,500,000=0:013863t

IN 787,500,000=0:013863t

(NOT VERY LONG)

AT CURRENT RATES, WHEN WILL THE POPULATION

HIT 1,000,000,000,000,000? 1 TRILLION!

P=Poekt -1,000,000,000,000 = 6,300,000,000 e

1,000,000,000,000 = e

158.73 = e

158.73 = e

IN 158.73 = . 013863t -> t= IN 158.73 = 365 YEARS

IN THE YEAR 2369 (2004 + 365)

OUR PLANET'S POPULATION WILL BE 1 TRILLION!

1,000,000,000,000 ! 2 / 2 / 2 /