	More on Using Tryonometric Identities
	Sin (AIB) = Sin A GOB I Sin B GOA
	Com (A LB) = Com A Com B = Shin A Shin A
(	2 Sin A COOP = Sin (A-B) + Sin (A+B)  rample  Product to Sun
	Sin 4x Coszx dx
	= \frac{1}{2} [Sin(4xex)+Sin(4xex)] dx
	= \frac{1}{2} \left( \sin \chi \chi \chi \chi \chi \chi \chi \chi
	2 - Co-6x 7 + C
	Sin mx co= hxdx, Sin mx sin nxdx,
	Soomx soons de can de handled
4	Similarly by those identities!

 $= \frac{1}{2} \left[ \cos (4x-3x) + \cos (4x+3x) \right] \times \cos (A+B) + \cos (A$  $\frac{1}{2} \left[ Sin x + Sin 7x \right] + C$ 2 din 7x Sin 5x dx  $\sum_{x \in \mathbb{N}} \left[ \cos(2x - 5x) - \cos(2x + 1x) \right] dx$  $\geq \frac{1}{2} \frac{\sin 2x}{2} - \frac{\sin 12x}{12} + C$ 

Example period = 277

The sime sin nx dx = So if m + n

Sime sin nx dx = If m=n

where m, n are tre integers If man, Simmx dx = It Coremx dx

double angle

formula 2

Coremx = (- Six mx  $\frac{1}{2} \left[ \frac{x}{2} - \frac{\sin 2\pi x}{2 \cdot 2\pi} \right]^{\frac{1}{2}} = \frac{1}{2} + \frac{1}{2} = \frac{1}{2}$ men  $\int Sni m x Sni n x dx$   $= \int \int [Go (m-n)x - Go (m+n)x] dx$   $= \int Sni (m-n)x - Sni (m+n)x$   $= \int Sni (m-n)x - Sni (m+n)x$ Sin nx Comedx = 0 for all n, ns (the integers)

Sin (n-m)x + Sin (n+mx) ) integration and

check it!!

Fouries Series = ao + a, cos x + a, cos x + a, cos x + b, sin x + b, sin x + b, sin x + + .... a cossp + a cos x cosx + a cosx + a cosx + a cosx + a cosx cosx + ...

t b sin x cosx + b sin x cosx + ... as June sx dx ( x Go Exdx ( Con 2x dx Stranx dx

, 1+tano = Sec 0 Sen 0 + 600 0 = 1 L Could be Relpful for integrals Example. Unvolving  $\frac{2}{a^2-x}, \frac{2}{a^2+x^2},$ What if  $\frac{2}{a^2-x^2} = 4 - 4 \frac{2n^2}{a^2}$ J 14- x2 dx 2 Coro do

54(1-sin²0) bet x = 25 mid, a  $\frac{dx}{d\theta} = 2 \cos \theta$   $\frac$ = [1d0 = 0+ C = sin x + C (1 4+x2 = 4+4tan 0 trangle Let x= 2 tand tand

dx = 2 sec 0 1/2 2 Seco do = 2500 (
2 Seco do = 5 do do seco = 2 tan 2 t C

Example Corrected after class

get ind of the I

2 19-x² dx

9-x² = 9-95in²0

X = 35in²0

35sin²0 19 co²0 · 3 cos0 d0

dx

3 cos0 = 81 Sm20 Cm20 do 5 25 m 0 as 0  $= \underbrace{81}_{4} \int s_{1}^{2} s_{2} ds ds$   $S_{1} c_{2} c_{3} ds$   $S_{2} c_{3} c_{$  $=\frac{81}{4}\left[\frac{1+6-40}{2}d0\right] \times \frac{31}{4}$ = 81 0+ Svita] + C = 81 Sin 3 + 2 Sin 20 Go20 ] + C = 81 [5-12 + 25mocoo[2co20-1]]+C  $= \frac{81}{8} \sin \frac{x}{3} + \frac{81}{4} \cdot \frac{x}{3} \cdot \sqrt{9-x^2} \left( \frac{29-x^2}{9} - 1 \right) + C$  Example Htan 0 = Sec 0 Trigonometric Substitution  $\int \frac{dx}{(4+x)^{3/2}}$ x = 2 tan0 $\frac{dn}{dA} = 2 \text{ Sec 0}$ 2 Sec 0 d0 (4 Sec 0)3/2 J & Seco do tand = } = 1 SindyC 4 Coso do = 454+x2