Rules:

$$\int (X^n)dX = \frac{X^{n+1}}{X+1} + C$$

$$\int (\sin nX) dX = \frac{1}{n} \cos nX + C$$

$$\int (\cos nX) dX = -\frac{1}{n} \sin nX + C$$

$$\int (\sin^2 nX) dX = \frac{1}{2} \int (1 - \cos 2nX) dX$$

$$\sin^2 A = \frac{1}{2} (1 - \cos 2A)$$

$$\int (\cos^2 hx) dx = \frac{1}{2} \int (1 + \cos 2hx) dx$$

$$\cos^2 A = \frac{1}{2} (1 + \cos 2h)$$

Integral calculus:

THE SYLLABUS

Integration techniques (integrals of sums, multiplying constants, and substitution) applied to:

b. $\sin nx$, $\cos nx$, $\sin^2 nx$, $\cos^2 nx$;

d. functions of the form:

$$\frac{1}{x+a}$$
, $\frac{1}{a^2+x^2}$, $\frac{1}{\sqrt{(a^2-x^2)}}$, $\sqrt{(a^2-x^2)}$.

Definite integrals with applications to areas and volumes of revolution (confined to cones and spheres).

do each part of a sum separately

eq
$$\int (3x^2 + 1) dx = \int 3x^2 dx + \int 1 dx = X^3 + X + C$$

Integration techniques (integrals of sums, multiplying constants, and substitution) applied to:

move multiplying

constants outside Integral

Substitute expression with u to Simplify -also change 'dx' for 'du term'.
-also change limits.

eg.
$$\int 4\sin x dx = 4\int \sin x dx$$

= $4(-\cos x) + c = -4\cos x + c$

Definite integrals with applications to areas and volumes of revolution (confined to cones and spheres).

Generating Areas:

$$A = \int_{a}^{b} y.dx$$

Area between curve and x-axis

$$A = \int_a^b x.dy$$

Area between curve and y-axis

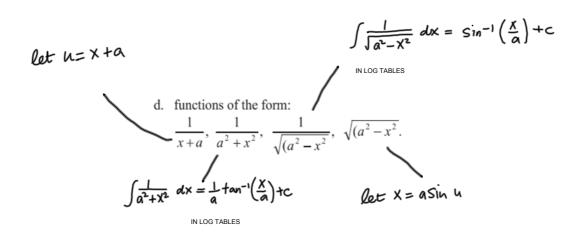
Generating Volumes

$$V = \pi \int_a^b y^2 dx$$

Rotating about x-axis

$$V = \prod_{a}^{b} X^{2} dy$$

Rotating about y-axis



Special cone:
$$\int \frac{f'(x)}{f(x)} dx = \ln x + c$$