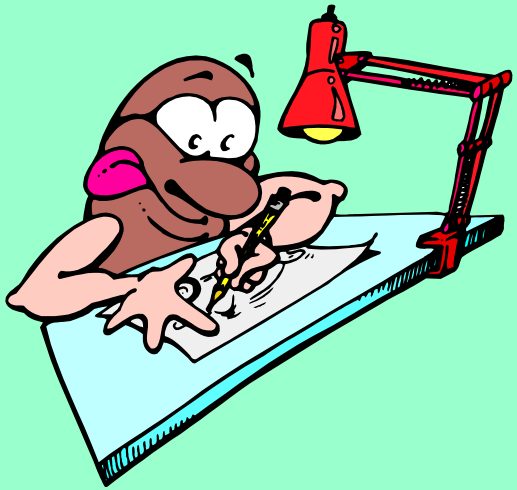

2. Integrating trig functions

Integration as anti-differentiation

We saw in the last lesson that:

$$\frac{d}{dx}(\sin x) = \cos x$$

$$\frac{d}{dx}(\cos x) = -\sin x$$

If we integrate both sides we get:

$$\int \frac{d}{dx}(\sin x) = \int \cos x$$

$$\int \frac{d}{dx}(\cos x) = -1 \times \int \sin x$$

SICk

$$\int \cos x = \sin x + C$$

$$-1 \times \int \sin x = \cos x$$

$$\int \sin x = -\cos x + C$$

ANGLES MUST BE IN RADIANS!!!

Example 1

Find

$(a)\ \int -4\sin x\ dx$

NAB

$(b)\ \int (4\sin\theta - \cos\theta)\ d\theta$

Solution:

$(a)\ \int -4\sin x\ dx$

$= -4\times\int \sin x\ dx$

$= -4\times -\cos x + C$

$= 4\cos x + C$

Only integrate functions of x

SICk

$(b)\ \int (4\sin\theta - \cos\theta)\ d\theta$

$= 4\times\int \sin\theta - \int \cos\theta\ d\theta$

$= 4\times -\cos\theta - \sin\theta$

$= -4\cos\theta - \sin\theta$

Heinemann, p.265, EX 14C,
Q1(a) to (f) & Q5