NAME: ACHUSI CHIKODILI YVONNE
MATRIC NO: 19/MHS01/015
Maths 104 Assignment
Integrate the following function

1) $\sin^6 x$

$\frac{dy}{dx}(\sin x^6)$

Use differentiation rules

$\frac{d}{dy}(\sin y \times \frac{dy}{dx} x^6)$

Calculate the derivatives

$\cos(y) \times 6x^3$

Substitute back

$\cos(x^6) \times 6x^5$

Reorder the terms

$\underline{6x^5 \times \cos x^6}$

2) $\cos^4 x \sin^3 x$

$\frac{dy}{dx} \cos x^4 \sin x^3$

Use differentiation rules

$\frac{dy}{dx} \cos x^4 \times \sin x^3 + \cos x^4 \times \frac{dy}{dx} \sin x^3$

Calculate the derivatives

$-\sin x^4 \times 4x^3 \times \sin x^3 + \cos x^4 \cos x^3 \times 3x^2$

Simplify the expression

$\underline{-4x^3 \times \sin x^4 \sin x^3 + 3x^2 \times \cos x^4 \cos x^3}$

3) $\cos x \sin 3x$

$\frac{dy}{dx}(\cos x \sin x^3)$

use differentiation rules

$\frac{dy}{dx}(\cos x \times \sin x^3 + \cos x \times \frac{dy}{dx} \sin x^3)$

Calculate the derivatives

$-\sin x \sin x^3 + \cos x \cos x^3 \times 3x^2$

reorder the terms

$-\sin x \sin x^3 + 3x^2 \times \cos x \cos x^3$