

MAT 104
 Dr Oyelomi's Class
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 19/ENG 05/014

1) $\int \frac{1}{x^2+7} dx$

$\int \frac{1}{x^2+(0.7)^2} dx$

$x = \sqrt{7} \tan \theta$

$dx = \sqrt{7} \sec^2 \theta \quad dx = \sqrt{7} \sec^2 \theta d\theta$

$\int \frac{\sqrt{7} \sec^2 \theta d\theta}{(\sqrt{7})^2 + (\sqrt{7})^2 \tan^2 \theta}$

$\int \frac{\sqrt{7} \sec^2 \theta d\theta}{(\sqrt{7})^2 (1 + \tan^2 \theta)}$

$\int \frac{\sqrt{7} \sec^2 \theta d\theta}{7 (\sec^2 \theta)}$

$\int \frac{\sqrt{7} d\theta}{7}$

$\frac{\sqrt{7} [\theta] + C}{7}$

$\theta = \tan^{-1} \frac{x}{\sqrt{7}}$

$\frac{\sqrt{7} \tan^{-1} \frac{x}{\sqrt{7}} + C}{7}$

$\theta = \tan^{-1} \frac{x}{\sqrt{7}}$

$\theta = \tan^{-1} \frac{\sqrt{7} x}{7}$

$= \frac{\sqrt{7} \tan^{-1} \frac{\sqrt{7} x}{7} + C}{7}$

2 $\int \frac{1}{x^2+b^2} dx$

$\int \frac{1}{x^2+a^2} dx$

$$x = 8 \tan \theta$$

$$\frac{dx}{d\theta} = 8 \sec^2 \theta$$

$$\int \frac{8 \sec^2 \theta d\theta}{8^2 + 8 \tan^2 \theta}$$

$$\int \frac{8 \sec^2 \theta d\theta}{8^2 (1 + \tan^2 \theta)}$$

$$\int \frac{8 \sec^2 \theta d\theta}{8^2 \sec^2 \theta}$$

$$\int \frac{1}{8} d\theta$$

$$\frac{1}{8} [\theta] + C$$

$$\theta = \tan^{-1} \frac{x}{8}$$

$$\underline{\underline{\frac{1}{8} \tan^{-1} \frac{x}{8} + C}}$$