

Math 132 Quiz  
Noon - 1 PM

1. Calculate

$$\frac{x-15}{(x-3)(x+1)} = \frac{A}{x-3} + \frac{B}{x+1}$$

$$x-15 = A(x+1) + B(x-3)$$

$$x=-1 \Rightarrow -16 = -4B \\ 4 = B$$

$$x=3 \Rightarrow -12 = 4A \\ -3 = A$$

$$\int \frac{x-15}{x^2-2x-3} dx.$$

$$= \int \frac{4}{x+1} - \frac{3}{x-3} dx$$

$$= 4 \ln|x+1| - 3 \ln|x-3| + C$$

2. Using a trigonometric substitution, calculate

$$x = 7 \sec \theta$$

$$dx = 7 \sec \theta \tan \theta d\theta$$

$$\int \frac{x}{\sqrt{x^2-49}} dx.$$

$$= \int \frac{7 \sec \theta}{\sqrt{49 \sec^2 \theta - 49}} \cdot 7 \sec \theta \tan \theta d\theta$$

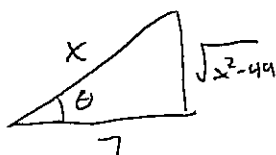
$$= \int \frac{49 \sec^2 \theta \tan \theta}{\sqrt{49 \tan^2 \theta}} d\theta$$

$$= \int \frac{49 \sec^2 \theta \tan \theta}{7 \tan \theta} d\theta$$

$$= 7 \int \sec^2 \theta d\theta$$

$$= 7 \tan \theta + C$$

$$= 7 \cdot \frac{\sqrt{x^2-49}}{7} + C = \sqrt{x^2-49} + C$$



$$\tan \theta = \frac{\sqrt{x^2-49}}{7}$$