

Quiz 11
Jan. 10, 2007

- Evaluate the integral (10 pts):

$$\int \frac{3x}{x^2 - 3x - 4} dx = ?$$

- Use the formulas to evaluate the integral (10 pts):

$$\int \frac{1}{2x^2 - 4x + 4} dx = ?$$

Formulas for indefinite integrals:

$$\int \frac{1}{\sqrt{x^2 + a^2}} dx = \ln(x + \sqrt{x^2 + a^2}) \quad \text{or} \quad \sinh^{-1} \frac{x}{a} \tag{1}$$

$$\int \frac{1}{ax^2 + bx + c} dx = \begin{cases} \frac{2}{\sqrt{4ac - b^2}} \tan^{-1} \frac{2ax + b}{\sqrt{4ac - b^2}} & \text{if } b^2 - 4ac < 0 \\ \frac{1}{\sqrt{b^2 - 4ac}} \ln \left(\frac{2ax + b - \sqrt{b^2 - 4ac}}{2ax + b + \sqrt{b^2 - 4ac}} \right) & \text{if } b^2 - 4ac > 0 \end{cases} \tag{2}$$

$$\int \frac{1}{x^2 + a^2} dx = \frac{1}{a} \tan^{-1} \frac{x}{a} \tag{3}$$

$$\int \frac{1}{x^2 - a^2} dx = \frac{1}{2a} \ln \frac{x - a}{x + a} \quad \text{or} \quad -\frac{1}{a} \coth^{-1} \frac{x}{a} \tag{4}$$