GROUP QUIZ 10 QUESTIONS

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Evaluate the following integrals, if possible. If the integral diverges, write "DIVERGES".
Use proper notation, and show all relevant work.

[a] $\int_0^{\infty} xe^{-2x}\,dx$ **[b]** $\int_0^{\pi} \tan x\,dx$ **[c]** $\int_0^{e} x^2 \ln x\,dx$

Determine if the following integrals diverge, without finding anti-derivatives. You may use the shortcuts involving $\int_c^d \frac{1}{x^p}\,dx$ **and** $\int_c^d b^x\,dx$ **shown in class without proving them.**

Show all relevant logic.

[a] $\int_{-1}^{1} \frac{2}{x^2-4}\,dx$ **[b]** $\int_1^{\infty} \frac{\sqrt{x}}{1+x^2}\,dx$ **[c]** $\int_0^{\infty} \frac{e^{-x}}{1+\sin^2 x}\,dx$

Show that $\int_0^1 \frac{1}{x^p}\,dx$ **converges if p < 1, and find its value.**

Use proper notation, and show all relevant logic.

Show that $\int_1^{\infty} \frac{1}{x^p}\,dx$ **converges if p > 1, and find its value.**

Use proper notation, and show all relevant logic.

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