What day of the month is your birthday?

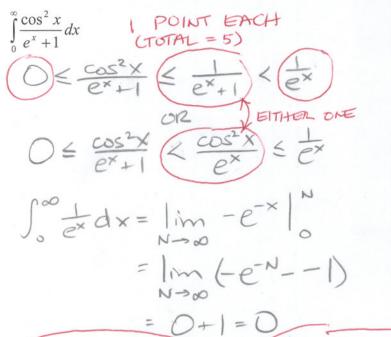
What are the last 2 digits of your address?

What are the last 2 digits of your zip code?

## THIS IS A NO CALCULATOR QUIZ

[10 POINTS] Determine whether the following integrals converge or diverge. You must show work which supports your conclusion.

You do NOT need to find the value of an integral if it converges.



$$\int_{2}^{\infty} \frac{\sqrt{x}}{x-1} dx \qquad \left( \frac{1}{10} \frac{1}{10} \frac{1}{10} + \frac{1}{10} \frac{1}{10} \right) = \frac{1}{x^{\frac{1}{2}}} \left( \frac{1}{10} \frac{1}{$$

= 0 + 1 = 0 = 0 + 1 = 0

[10 POINTS] Determine whether the following integrals converge or diverge. Find the value of each integral that converges.

You must show work which supports your conclusion.

$$\int_{-\infty}^{0} x^{2}e^{4x}dx$$

$$= \lim_{N \to -\infty} \int_{N}^{0} x^{2}e^{4x}dx$$

$$= \lim_{N \to -\infty} \int_{N}^{0} x^{2}e^{4x}dx$$

$$= \lim_{N \to -\infty} \left(\frac{1}{4}x^{2}e^{4x} - \frac{1}{8}xe^{4x} + \frac{1}{32}e^{4x}\right)\Big|_{N}^{0}$$

$$= \lim_{N \to -\infty} \left(\frac{1}{32} - \left(\frac{1}{4}N^{2} - \frac{1}{8}N + \frac{1}{32}\right)e^{4x}\right)$$

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$$\int_{1}^{\frac{X+1}{x^{3}}} dx = \left( \lim_{N \to \infty} \int_{1}^{\infty} \left( \frac{1}{X^{2}} + \frac{1}{X^{3}} \right) dx \right)$$

$$= \lim_{N \to \infty} \left( -\frac{1}{X^{2}} + \frac{1}{X^{3}} \right) dx$$

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 $\frac{1}{32} - 0 = \frac{1}{32} \pm \frac{1}{2}$   $\lim_{N \to \infty} \left( \frac{1}{4} N^2 - \frac{1}{8} N + \frac{1}{32} \right) e^{4N} = \frac{1}{4} e^{4N}$ 

$$\lim_{N \to -\infty} \frac{\frac{1}{4}N^2 - \frac{1}{8}N + \frac{1}{32}}{e^{-4N}} = \lim_{N \to -\infty} \frac{\frac{1}{2}N - \frac{1}{8}}{\frac{1}{4}e^{-4N}} = \lim_{N \to -\infty} \frac{\frac{1}{2}N}{\frac{1}{6}e^{4N}}$$