

9. [10 points] Determine whether the following integrals converge or diverge. Justify your answer.

a. [5 points] $\int_1^\infty \frac{x^2}{e^{-x} + 3x^3} dx$

b. [5 points] $\int_0^1 \frac{x \cos(x) - \sin(x)}{x^2} dx$

$\left(\text{Hint: } \frac{d}{dx} \left(\frac{\sin(x)}{x} \right) = \frac{x \cos(x) - \sin(x)}{x^2}. \right)$

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