

## MATH 142: Practice Midterm 2

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Show all appropriate work. Variables may represent any real number.

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1. Determine if  $\int_1^{\infty} xe^{-x} dx$  is convergent or divergent. If convergent, find its value.
2. Evaluate  $\int_0^{10} (x-1)^{-1/5} dx$ .
3. Find the volume of the solid generated by revolving the curve  $y = \sqrt{4-x^2}$ ,  $-2 \leq x \leq 2$ , about the  $x$ -axis.
4. Set up, but do not solve, an integral for the volume of the solid obtained by rotating the region bound by the graphs of  $y = x^2$  and  $y = x + 6$  about the  $x$ -axis.
5. Evaluate the following limits:
  - (a)  $\lim_{x \rightarrow 0} \tan(x) \ln(x)$ .
  - (b)  $\lim_{x \rightarrow \infty} \frac{1}{\sqrt{x} \ln x}$ .