



Philadelphia University
Department of Basic Sciences and Mathematics



Academic Year:	2016–2017	Course Name:	Applied Math
Semester:	Second Semester	Course Number:	250473
Exam:	First Exam	Instructor Name:	Feras Awad
Exam Date:	06/04/2017	Student Name:	_____
Exam Day:	Thursday	University ID:	_____
Mark:	[20]	Serial:	_____

1. (2 points) Find the exact value of $\Gamma\left(\frac{2}{3}\right) \div \Gamma\left(\frac{8}{3}\right)$.

2. (2 points) Use Stirling's formula to evaluate $\lim_{n \rightarrow \infty} \left[\frac{n! e^n}{n^{n+\frac{1}{2}}} \right]$.

3. (4 points) The integral $Ei(x) = \int_{-\infty}^x \frac{e^t}{t} dt$ is called *exponential integral*, while the integral

$li(x) = \int_0^x \frac{1}{\ln t} dt$ is called *logarithmic integral*. Show that $li(e^x) = Ei(x)$.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5. (4 points) Express as a Γ function $\int_0^1 \left[\ln \left(\frac{1}{x} \right) \right]^{p-1} dx$

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

6. (4 points) Evaluate $\int_0^{\pi/2} \sqrt{\tan \theta} d\theta$.

[illegible]