Math 102 Final Exam
Professor Donnayj Fall pnnt

You have 3 hours to take the test.

During the test, you may use a 3"x5" index card with notes written on one side; the trig formulas which are included on this page and the integral tables at the back of the test packet. Include your index card with your exam. On some questions (#1, 2, 5, 8), you may use a calculator.

You should show your work clearly. Your goal in writing your solution is to convince the skeptical reader that your answer is correct. Answers given without justification will not receive full credit. Be careful to state your final answer rather than just showing your calculations.

The test has 9 questions on 13 pages (starting with page 2) worth a total of 230 points. If by chance there is a mistake in a question or something does not make sense, do the best you can and explain what you thought the question was asking.

Trig Formulas:

Angle Summation Formulas:

\[
\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y \\
\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y
\]

When \( x = y \), we get double angle formula

\[
\sin 2x = 2 \sin x \cos x \\
\cos 2x = \cos^2 x - \sin^2 x
\]

The square formulas

\[
\sin^2 x = \frac{1}{2}(1 - \cos 2x) \\
\cos^2 x = \frac{1}{2}(1 + \cos 2x)
\]

\[
\sin A \cos B = \frac{1}{2} [\sin(A - B) + \sin(A + B)] \\
\sin A \sin B = \frac{1}{2} [\cos(A - B) - \cos(A + B)] \\
\cos A \cos B = \frac{1}{2} [\cos(A - B) + \cos(A + B)]
\]