Exam two is cumulative, but the emphasis is on the topics discussed in lecture during Weeks 4, 5, and 6 (textbook sections 7.2, 7.3, 7.5, 7.6, 10.1, and supplement sections 2, 3, and 5); this means that the exam questions are similar to your homework problems and lecture examples from Weeks 4-6, but you are still expected to be able to use techniques from the first part of the course such as u-substitution.

Here is an outline of what to know how to do from each of the sections:

- **Supplement 2:** Know how to write the sine and cosine functions in terms of the complex exponential function. Know how to integrate a complex exponential function, e.g. $\int e^{2ix} \, dx$.

- **Supplement 3:** Know how to use complex exponential functions to evaluate integrals involving trig functions. Know how to convert your answer back to real-valued functions (without $i$’s in them) in simple examples such as $\int \cos(2x) \sin(5x) \, dx$ but NOT in more complicated examples such as $\int e^{7x} \cos(2x) \, dx$.

- **Section 7.2:** Know how to evaluate integrals such as $\int \sin^3(x) \cos^4(x) \, dx$ and $\int \sec^4(x) \tan^5(x) \, dx$ using a combination of a u-sub and a trig identity.

- **Section 7.3:** Know how to evaluate integrals using trig substitutions.

- **Section 7.5 and Supplement 5:** Know how to find partial fraction expansions (PFE’s) and use them to evaluate integrals of rational functions.

- **Section 7.6:** Know how to use the definition of an improper integral as a limit to determine whether it converges or diverges; when it is not possible to use the definition, know how to determine convergence or divergence using the comparison test.

- **Section 10.1:** Know how to write out the first terms of a sequence. Know how to determine the limit of a sequence using Theorem 1 (page 539) together with 20A techniques for determining the limits of continuous functions such as L’Hopital’s Rule and the Squeeze Theorem.