Show ALL work for credit; be neat; and use only ONE side of each page of paper. Do NOT write on this page. Calculators can be used for graphing and calculating only. Give exact answers when possible.

Helpful facts:
\[
\frac{cx + d}{(x - a)(x - b)} = \frac{1}{a - b} \left( \frac{d + ca}{x - a} - \frac{d + cb}{x - b} \right)
\]
\[
\cos(ax) \sin(bx) = \frac{1}{2} (\sin((a + b)x) - \sin((a - b)x))
\]
\[
\sin(ax) \sin(bx) = \frac{1}{2} (\cos((a + b)x) + \cos((a - b)x))
\]
\[
\cos(ax) \cos(bx) = \frac{1}{2} (\cos((a + b)x) + \cos((a - b)x))
\]
\[
\int \frac{dx}{a^2 + x^2} = \frac{1}{a} \arctan \frac{x}{a} + C
\]
\[
\int \frac{dx}{\sqrt{a^2 - x^2}} = \arcsin \frac{x}{a} + C
\]
\[
\int e^{ax} \sin(bx) \, dx = \frac{1}{a^2 + b^2} (ae^{ax} \sin(bx) - be^{ax} \cos(bx)) + C
\]
\[
\int e^{ax} \cos(bx) \, dx = \frac{1}{a^2 + b^2} (ae^{ax} \cos(bx) + be^{ax} \sin(bx)) + C
\]
\[
\sin^2 x = \frac{1}{2} (1 - \cos 2x) \quad \cos^2 x = \frac{1}{2} (1 + \cos 2x)
\]

Roughly 4 – 5 problems like those from pages 373–374 of the text. For example, 14, 15, 33, 45, 48, 69, 76, 85 provide a range of techniques.

A Problem or two from the review section, pages 369 – 371 of the text. For example, I could collect 30 – 33 into one problem, but I would add one so it would have 5 parts. (Easier to grade as all problems are worth the same 10 points.)

A problem or two from the homework.

Similar problems. I’ve been known to take examples from the book or to rephrase a problem even to turning it on its head.

A problem or part of a problem that requires a calculator to compute an integral approximation like simpson’s rule.

A Maple syntax problem, find the errors in an input statement.

Problems that are really Calculus I problems, but require the integration techniques of this chapter. Like find \( F(x) \) such that \( F(2) = 3 \) and \( F'(x) = x \sin x \). Or find the area under the curve of \( f(x) = \frac{1}{x^3} \) from \( x = a \) to \( x = \infty \).

Some problems will be wordy and/or pictorial.