The midterm will be from sections 4.10, 5.1-5.5, 6.1-6.3. Following are some practice problems.

1. Find the following integrals.
   (a) \( \int e^s \cos(e^s) \, ds \)
   (b) \( \int_0^1 \frac{e^x}{1+e^x} \, dx \)
   (c) \( \int_0^1 (\sqrt{u} + 1)^2 \, du \)
   (d) \( \int_0^2 t \sqrt{1 + t^2} \, dt \)
   (e) \( \int \frac{e^{\sqrt{x}}}{\sqrt{x}} \, dx \)
   (f) \( \int \tan x \ln(\cos x) \, dx \)

2. Find the area of the region enclosed by the line \( y = x - 1 \) and the parabola \( y^2 = -2x + 5 \).

3. Find the volume of the solid obtained by rotating the region bounded by \( y = x^2, \ y^2 = x \) about the \( x \)-axis.

4. Find the volume of the solid generated by rotating the region bounded by the curves \( y = e^{-x^2}, \ y = 0, \ x = 0, \ x = 1 \) about \( y \)-axis.

5. Find the derivative of the function.
   (a) \( f(x) = \int_1^x \sqrt{1 + t^4} \, dt \).
   (b) \( f(x) = \int_0^x 3^{\frac{t}{4}} \sin(t^2) \, dt \).
   (c) \( f(x) = \int_1^{3x+1} \sin(t^4) \, dt \).

6. A particle moves along a line with velocity function \( v(t) = t^2 - t - 12 \), where \( v \) is measured in meters per second. Find (a) the displacement and (b) the distance traveled by the particle during the time interval \([1, 6]\).