(1) Integrate:
   (a) $\int \sqrt[3]{x+5}\,dx$
   (b) $\int \frac{e^{x-x^2}}{e^{1-x^2}}\,dx$
   (c) $\int x^2 + x\,dx$

(2) Compute the definite integral:
   (a) $\int_{-1}^{3} \sqrt{2x+3}\,dx$
   (b) $\int_0^1 \frac{3}{x+2} - \frac{1}{x^4}\,dx$
   (c) $\int_{-2}^{2} \frac{3}{2e^{3x}}\,dx$

(3) Find the area of the region:
   (a) between the graphs of $f(x) = x^2$ and $g(x) = \sqrt{x}$ between $x = 0$ and $x = 2$
   (b) bounded between the curves $f(x) = 4 - 2x^2$ and $g(x) = 1 - x^2$
   (c) bounded between the curves $f(x) = \frac{1}{2}x^3 + 2x$ and $g(x) = x^3$

(4) Set up a Riemann sum with $n = 4$ and midpoints to estimate the area under the graph of $f(x) = \frac{1}{x^2+2}$ between 0 and 2.

(5) Approximate $(3e^{-.01}) \cdot .01 + (3e^{-.02}) \cdot .01 + \cdots + (3e^{-1}) \cdot .01$.

(6) Calculate $\lim_{n\to\infty} \left(1^3 + \left(1 + \frac{1}{n}\right)^3 + \left(1 + \frac{2}{n}\right)^3 + \cdots + \left(1 + \frac{n-1}{n}\right)^3\right) \cdot \frac{1}{n}$.

(7) Calculate the volume of the solid of revolution obtained ivy rotating the region...
   (a) under the graph of $f(x) = (x-1)^2$ between 0 and 3 about the x-axis.
   (b) under the graph of $f(x) = \sqrt{9 - x^2}$ between -3 and 3 about the x-axis.
   (c) bounded between the graphs of $f(x) = x^2$ and $g(x) = \sqrt{x}$ about the x-axis.

(8) For what value of a is the area bounded between the curves of $y = x^2$ and $y = ax$ one?