Student Involvement:

1. Find the integral $\displaystyle\int_1^\infty \frac{\ln x}{x^2}\,dx$

2. Take the area between the curve $y = \sqrt{x}$ and the x-axis between $x = 0$ and $x = 4$ and revolve it around the x-axis. Find the volume.

   What happens if you revolve around the y-axis?

3. Find the sum of the series $\displaystyle\sum_{n=1}^{\infty} 3(0.2)^n$

   How about the sum of the series $\displaystyle\sum_{n=3}^{\infty} 3(0.2)^n$

4. Find the sum of the series $\displaystyle\sum_{n=1}^{\infty} \frac{2^n}{n!}$

   How about the sum of the series $\displaystyle\sum_{n=2}^{\infty} \frac{2^n}{n!}$

5. Find the limits

   $$\lim_{x\to 0} \frac{\sin x}{2x} \qquad\qquad \lim_{x\to 0} \frac{\tan 4x}{2x}$$

6. Find the equation of the parabola that goes through the points $(0,0)$, $(1,0)$, $(2,2)$.

   How about the points $(1,1)$, $(-1,4)$, $(2,0)$?

7. Find the integrals

   $$\int \frac{3x^3 - 7x^2 - 6x - 3}{x^4 + x^3}\,dx$$

   $$\int \frac{-5e^x - 9}{e^{2x} + 4e^x + 3}\,dx$$