BC Calculus
Review for Test # 9 (138)

129. A) Find the area of the region that is inside r = 4 and outside $r = 2 + 2\sin\theta$.
B) Find the area inside $r = \sin 2\theta$.

130. Determine whether each of the following series converge or diverge. Give a reason for your answer.

A) $\sum_{n=1}^{\infty} \frac{2}{n!}$ B) $\sum_{n=1}^{\infty} \frac{n^3}{3^n}$ C) $\sum_{n=1}^{\infty} \frac{3^n}{n^3}$ D) $\sum_{n=1}^{\infty} \frac{3^n}{n^n}$

131. A) $\int_0^{\infty} \frac{2}{x^2}\,dx =$ B) $\int_2^4 \frac{x+1}{x^2-4x+3}\,dx =$

132. Determine whether each of the following series converge or diverge. Give a reason for your answer.

A) $\sum_{n=1}^{\infty} \frac{n+10}{n^3-5}$ B) $\sum_{n=2}^{\infty} \frac{\ln n}{n^2}$ C) $\sum_{n=2}^{\infty} \frac{\sqrt{n-2}}{n^{4/3}+2}$

133. A) Use Euler's method, with n = 6, to estimate the value of y when x = 2, if y = 3 when x = 1 and $\frac{dy}{dx} = x + 2y$.
B) Without using a calculator, use Euler's method, with n = 2, to estimate the value of y when x = 3, if y = 2 when x = 1 and $\frac{dy}{dx} = xy$.

134. A) Find the slope of $r = 3\sin\theta$ at $\theta = 3$.
(Recall there are three ways you should be able to do this.)
B) Find the equation of the line tangent to $r = 2 + 2\cos\theta$ at $\theta = \frac{3}{8}\pi$.

135. Determine whether each of the following series converge or diverge. Give a reason for your answer.

A) $\sum_{n=1}^{\infty} \frac{\cos n}{4n^3}$ B) $\sum_{n=1}^{\infty} (-1)^n \frac{3n}{4n-3}$

136. Find the slope of the line that can be drawn tangent to the function $f(x) = \int_{2x^3}^{4} \frac{t}{\sin t}\,dt$ at $x = \frac{\pi}{6}$.

137. Evaluate $\int_{-2}^{4} f(x)\,dx$ if $f(x) = \begin{cases} e^x, & x < 0 \\ 4 - x^2, & 0 \le x \le 2 \\ -2x + 8, & x > 2 \end{cases}$

138. Determine whether each of the following series converge or diverge. Give a reason for your answer.

A) $\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$ B) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{2^n}{n^2}$ C) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{\ln n}{n}$