King Fahd University of Petroleum and Minerals
Quiz 4 Math 102 (Semester 121) Duration: 40 minutes

Full Name:
ID:

Question 1 Find the interval of convergence of the series

$$\sum_{n=3}^{\infty} \frac{(5x-1)^n}{2^n \ln n}$$

Question 2 Find the arc length of the curve $y + \ln(\cos x) = 3$ between the two points $(0, 3)$ and $(\frac{\pi}{3}, 3 + \ln 2)$.

Question 3 Find a power series representation of $f(x) = \frac{3x^3}{(x-3)^2}$. Then find the sum of $\sum_{n=1}^{\infty} \frac{n}{3^n}$.

Question 4 Find the Maclaurin series of $f(x) = x \tan^{-1}(x^2)$.

Question 5 Find the sum of

$$\frac{1}{6} - \frac{\pi}{6} + \frac{1}{3!}\left(\frac{\pi}{6}\right)^3 - \frac{1}{5!}\left(\frac{\pi}{6}\right)^5 + \cdots.$$

Question 6 Find the first 3 non-zero terms of the Taylor series of $f(x) = \sin(2x)$ centered at $\frac{\pi}{2}$.