King **F**ahd **U**niversity for **P**etroleum and **M**inerals
Department of Mathematics & Statistics
Term 151 Math 101 (14) Quiz#5 (3.9, 3.10, 3.11, and 4.1)
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Q1. The area of a circle increases at a rate of $1\ {cm^2}/{\min}$. Find the rate of change of the perimeter when the area is $4\pi\ \text{cm}^2$.

Q2. The **diameter** of a sphere is given as 4 cm with a possible error in measurement of 0.02 cm. Estimate the relative error in the calculated volume.

Q3. If $\sinh x = -1$, evaluate $\operatorname{csch}(2x)$.

Q4. Find the absolute extreme values of $f(x) = \ln(x^2 + x + 1)$ on $[-1,1]$.