

QUIZ 15

Time:10min

Choose *one* of the following two sets of problems:

Set 1.

1. Show that the power series representation for $\frac{1}{1+x}$ is given by $1 - x + x^2 - x^3 + x^4 \dots$, by recalling the summation formula for the geometric series.
2. Use the above problem and a term by term integration to find a power series for $\ln(1+x)$.
3. Use the previous problem to find the sum of the alternating harmonic series.

Set 2.

1. Use problem 1 in the first set above to find a power series representation for $\frac{1}{1+x^2}$.
2. Use the previous problem and a term by term integration to find a power series for $\tan^{-1} x$.
3. Use the previous problem to obtain a series which converges to π .

Each set is worth a total of 10 points.