**First Mid Term Exam 201 Math Math. Department. First term ( 1434-1435 ) Duration : 2 Hours \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Question One [ 6 marks ]**

**1. Determine whether the following sequence is increasing, decreasing, or not monotonic.**

**Is the sequence bounded? .**

**2. Determine whether the following sequence converges or diverges. If it converges, find the limit.**

**3. Find a formula for the general term of the following sequence, assuming that the pattern of the first few terms continues.**

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**Question Two [ 6 marks ]**

**1. Find the radius of convergence and interval of convergence of the following series.**

**2. Find the power series representation for the function and the radius of convergence.**

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**Question Three [ 8 marks ]**

**a) Test the following series for convergence or divergence**

**1. “ by using the Limit Comparison test”**

**2. “ by using the Root test”**

**3. “ by using the Limit Comparison test”**

**b) Use the integral test to determine whether the series is convergent or divergent.**

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