

Group Exam 7

Name: _____

Math 142

Name of group member: _____

Professor Johnson

Name of group member: _____

Problem 1: For each of the sequences below:

(i) Find the first 5 terms of the sequence.

(ii) Determine whether the sequence converges or diverges. If it converges, find the limit. If it diverges explain why.

a) $\{n3^{-n}\}_{n=1}^{\infty}$

b) $\{\frac{(n+2)!}{n!}\}_{n=4}^{\infty}$

c) $\{2 + (-1)^n\}_{n=1}^{\infty}$

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Problem 2: Find the 4th degree Taylor polynomial for $f(x) = \sqrt[3]{x}$ centered at $x = 8$.

Use this Taylor polynomial to approximate $\sqrt[3]{8.2}$ (you may use your calculator for this calculation). How many decimal places (to the right of the decimal point) are accurate in your approximation? What is the error?

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Problem 3: Find a general formula for the k^{th} degree Taylor polynomial centered at $x = 0$ of $f(x) = \sin(x)$. Hint: Find the coefficients c_0, c_1, c_2, c_3 , etc until you see the pattern for c_n .

Use your graphing calculator to graph the functions $T_{15}(x)$ and $f(x) = \sin(x)$ in the same window. Sketch the graphs below and give a range of x-values where the approximation $\sin(x) \approx T_{15}(x)$ looks like a good approximation.

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