Math 76 Assessment 17   §6.2 Combining Power Series; Integration and Differentiation of Power Series

Things to remember:

1. The problem to complete is shown below. Write your name and solution on the next page where instructed.

2. Please make sure your full name is written neatly in the box.

3. Your score will be determined by **Mechanics** (2 points) and by **Content** (3 points).

4. The following rubric will be used for **Mechanics**:

Clear neat work, steps in order and easily followed, proper use of notation	2
Mostly clear work; minor errors in notation or skipped steps	1.5
Steps/handwriting hard to follow/read; major errors in notation	1
No discernible or relevant work, or work impossible to read/follow	0

5. You are not allowed to consult outside sources, including notes, books, the internet, or other people, while taking this assessment. Calculators are allowed only for basic numerical or scientific computations, not for graphing or algebra.

6. If you need more room, you may finish on a plain piece of paper or blank document. If you do all your work on separate sheets, please **copy the problem** and make sure to write **Version C** at the top of the first page.

7. When you are finished, create a legible, well-lit **.pdf file** of your work and upload it to Assessment 17 on Gradescope. Please follow the directions to **assign the page(s)** of your submission that contain your work for the question. More info about submitting to Gradescope:

<div align="center">

`http://bit.ly/gradescope-help`

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Use integration or differentiation of power series to find a power series centered at 0 for the function $f(x)$ given. There is a hint to help you.

Your solution should include:

- (0.5 point) Explanation of the strategy used (differentiation/integration);

- (0.5 point) Correct derivative/integral of the given function (or the one in the hint);

- (1 point) Correct power series for the derivative/integral of the given function (or the one in the hint);

- (0.5 point) Correct computation of the integral/derivative of your power series;

- (0.5 point) Correct power series for $f(x)$ (0 if no explanation).

Version C

Follow the directions on the previous page. Use integration and/or differentiation to find a power series centered at 0 for the function

$$f(x) = x^4 \ln(2 - 3x).$$

Hint. Consider $\ln(2 - 3x)$ separately first.

$f(x) = \ln(2 - 3x)$

$f'(x) = -\dfrac{3}{2 - 3x}$

$\dfrac{\frac{3}{2}}{1 - \boxed{\frac{3x}{2}}}$ $a = \dfrac{3}{2}$

$r = \dfrac{3x}{2}$

$\displaystyle\sum_{n=0}^{\infty} a(r)^n$

$x^4 \displaystyle\sum_{n=0}^{\infty} \frac{3}{2}\left(\frac{3x}{2}\right)^n$

$\dfrac{3x^4}{2}\left(\dfrac{3x}{2}\right)^n$

$\boxed{\displaystyle\sum_{n=0}^{\infty} \frac{3x^4}{2}\left(\frac{3x}{2}\right)^n}$ $\checkmark$

I took the derivative of $\ln(2-3x)$ to get it into the form of $\dfrac{1}{1-x}$

So that i could write it as a power series then multiply by x^4