

Homework questions for sections 12.6, 12.7, 12.8

Math 104, Fall 2007

1. Find the interval of convergence for the following power series,

$$\sum_{n=0}^{\infty} \frac{(2x + 5)^n}{2n + 1}$$

- A.) $(-1, 1]$ B.) $[-1, 1)$ C.) $(-2, 1]$ D.) $[-2, 1)$ E.) $(-3, -2]$ F.) $[-3, -2)$

2. Find the *first term* (the term with the lowest power of x) in the power series for the integral

$$f(x) = \int_0^x \frac{2t}{t^2 + 3} dt.$$

(**Hint:** Start from a geometric series, and modify step-by-step.)

- A.) $\ln 3$ B.) $\frac{1}{2}x$ C.) $\frac{2}{3}x$ D.) $\frac{1}{2}x^2$ E.) $\frac{1}{3}x^2$ F.) $\frac{1}{9}x^3$

3. Find the power series of the function

$$f(x) = \frac{1}{(1+x)^3}.$$

(**Hint:** Start from a geometric series, and modify step-by-step.)

A.) $f(x) = 1 + 2x + 4x^2 + 8x^3 + \dots$

B.) $f(x) = 1 - 2x + 4x^2 - 8x^3 + \dots$

C.) $f(x) = 1 + 3x + 6x^2 + 10x^3 + \dots$

D.) $f(x) = 1 - 3x + 6x^2 - 10x^3 + \dots$

E.) $f(x) = 1 + 6x + 12x^2 + 20x^3 + \dots$

F.) $f(x) = 1 - 6x + 12x^2 - 20x^3 + \dots$