

Miniexam 5 (8 POINTS TOTAL)

MATH 141, SUMMER 2016

NAME:

Problem 1 Express $f(x) = \frac{x}{x+3}$ as a power series.

- (a) $\frac{x}{3} - \frac{x^2}{9} + \frac{x^3}{27} - \frac{x^4}{81} \dots$
- (b) $-x + \frac{x^2}{3} - \frac{x^3}{9} + \frac{x^4}{27} \dots$
- (c) $1 - \frac{x}{3} + \frac{x^2}{9} - \frac{x^3}{27} \dots$
- (d) $-3x + x^2 - \frac{x^3}{3} + \frac{x^4}{9} \dots$
- (e) $3x - x^2 + \frac{x^3}{3} - \frac{x^4}{9} \dots$

Problem 2 Find the Taylor series of $f(x) = e^x$ centered at $a = 3$.

- (a) $\sum_{n=0}^{\infty} \frac{e^n (x-3)^n}{n!}$
- (b) $\sum_{n=0}^{\infty} \frac{e^3 (x-3)^n}{n!}$
- (c) $\sum_{n=0}^{\infty} \frac{x^n}{n!}$
- (d) $\sum_{n=0}^{\infty} \frac{(x-3)^n}{n!}$
- (e) $\sum_{n=0}^{\infty} \frac{ex^n}{n!}$

Problem 3 Find the interval of convergence for the power series $\sum_{n=0}^{\infty} \frac{(x-3)^n}{n+1}$

- (a) $[2, 4)$
- (b) $(2, 4]$
- (c) $(-1, 1]$
- (d) $[-1, 1)$
- (e) $[-3, 3)$

Problem 4 Evaluate the indefinite integral $\int \frac{t}{1-t^2} dt$ as a power series.

- (a) $\sum_{n=0}^{\infty} \frac{t^{2n+1}}{2n+1} + C$
- (b) $\sum_{n=1}^{\infty} t^{2n} + C$
- (c) $\sum_{n=0}^{\infty} \frac{t^{2n+2}}{2n+2} + C$
- (d) $\sum_{n=1}^{\infty} \frac{t^n}{n+1} + C$
- (e) $\sum_{n=0}^{\infty} \frac{t^{2n}}{2n} + C$

Feedback:

1. Any comments (on lectures, homework, quizzes, course, me, etc.)?