

Math 1B Section 107 Quiz #9

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Name: _____

1. (3 pts) Write

$$\sum_{n=1}^{\infty} \frac{x^{n-1}}{n^2 + n} = \frac{1}{2} + \frac{x}{6} + \frac{x^2}{12} + \frac{x^3}{20} + \frac{x^4}{30} + \frac{x^5}{42} + \dots$$

in terms of elementary functions. (*Hint: Partial fractions*) For what values of x is your solution justified?

2. (3 pts) Find the Taylor series expansion of $\cos(x)$ centered at $c = \pi/2$. What is the interval of convergence for this series?

3. (4 pts) For the following power series

- (a) find the general n th term (i.e. write it as $\sum_{n=0}^{\infty}(\text{something})$)
- (b) find the radius of convergence
- (c) check whether the series converges at the endpoints

so that you can determine for which x the series

- converges absolutely
- converges conditionally
- diverges.

$$\frac{1}{4} + \frac{2x}{9} + \frac{3x^2}{16} + \frac{4x^3}{25} + \frac{5x^4}{36} + \frac{6x^5}{49} + \dots$$