Math 1B Section 112 Quiz #9

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GSI: Theo Johnson-Freyd
http://math.berkeley.edu/∼theojf

Name: _____

1. (3 pts) Write

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

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 $\sin(x)$ 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 nth term (i.e. write it as $\sum_{n=0}^{\infty}$(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.

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