Name _____

Homework 17
Section 10.2

1. (6) Find the first four nonzero terms of the Taylor series for $\dfrac{1}{\sqrt{1+x}}$ about $x = 0$.

2. (6) Find the first four nonzero terms of the Taylor series for $\tan^{-1} x$ about $x = 1$.

3. (3) Find the exact sum of the following series:

$$\frac{\pi}{6} - \frac{\pi^3}{6^3 \cdot 3!} + \frac{\pi^5}{6^5 \cdot 5!} - \frac{\pi^7}{6^7 \cdot 7!} + \frac{\pi^9}{6^9 \cdot 9!} - \cdots$$

4. (3) Solve for t: $1 - \frac{t}{2} + \frac{t^2}{4} - \frac{t^3}{8} + \frac{t^4}{16} - \cdots = \frac{7}{12}$

5. (3) What is the exact sum of the alternating harmonic series, $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n}$?
(You should recognize this as a Taylor series evaluated at a particular value).