

Quiz 8 ————— **Math 1272**

1 Find the 6th degree Taylor polynomial for $\cos(x)$ around $x = \pi/2$. This means find the Taylor series up to the 6th degree term.

2 For $|x| < 1$, $\arctan(x)$ can be represented by the convergent power series:

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

For $|x| \leq .5$ what is the maximum error if you approximate $\arctan(x)$ by the finite sum $\sum_{n=0}^4 (-1)^n \frac{x^{2n+1}}{2n+1}$? (hint: think alternating series)

3 Given that the 4th degree Taylor polynomial around $x = 0$ for $f(x) = (1 + x)^{\frac{1}{2}}$ is:

$$(1 + x)^{\frac{1}{2}} \approx 1 + \frac{x}{2} - \frac{x^2}{8} + \frac{x^3}{16} - \frac{5x^4}{128}$$

Find the 5th degree Taylor polynomial for $(1 + x)^{\frac{3}{2}}$.