

- (1) If  $|x| < 0.3$  and we use  $1 - \frac{x^2}{2}$  to approximate  $\cos x$ , find the error
- (a) by using the Remainder Theorem with  $R_2$ .
  
  
  
  
  
  
  
  
  
  
  - (b) by using the Remainder Theorem with  $R_3$ .
  
  
  
  
  
  
  
  
  
  
  - (c) Compare these estimates. Is it mathematically correct to use either one? Why? Which is better? How do these relate to the Alternating Series error approximation?
- (2) If 3 (non-zero) terms of the series for  $\cos x$  are used to approximate  $\cos(1.8)$ , estimate the error. (That is, find an upper bound).
- (3) If 4 (non-zero) terms of the series for  $\sin x$  are used to approximate  $\sin x$  and the error is to be less than 0.05, what values of  $x$  may be used?
- (4) To approximate  $\cos 3$  with an error less than 0.005, how many terms must be used?

- (5) Write Taylor's formula with remainder for  $f(x) = \cos(3x)$  for  $a = \pi/12$  and  $n = 3$ .
- (6) Write Taylor's formula with remainder for  $g(x) = x^{3/2}$  for  $a = 1$  and  $n = 2$ .
- (7) Write Taylor's formula with remainder for  $e^{-x/2}$  for  $a = 0$  and  $n = 3$ .