Find the Taylor series for $f(x)$ centered at the given value of $a$, and find the corresponding radius of convergence. Answers without justification will get no partial credit.

1. 
   
   $f(x) = \ln x$, \hspace{1em} a = 10$
   

2. 
   
   $f(x) = \frac{1}{x}$, \hspace{1em} a = 5$
   

3. Find Maclaurin series for $f(x) = x \cos 4x$. 