

2.47 (c)  $y' = \frac{1}{1+x} \quad \left| \quad y''' = \frac{2}{(1+x)^3} \right| \quad y^{(n)} = \frac{(-1)^{n-1} (n-1)!}{(1+x)^n}$  "2.47"

$y'' = -\frac{1}{(1+x)^2} \quad \left| \quad y^{(4)} = \frac{-6}{(1+x)^4} \right|$

2.48  $\frac{(-1)^{n-1}}{1+x} = \frac{1}{1+x} \quad \checkmark$

2.49  $y^{(k)} = \frac{(-1)^{k-1} (k-1)!}{(1+x)^k}$

$y^{(k+1)} = \left[ \frac{(-1)^{k-1} (k-1)!}{(1+x)^k} \right]' = \frac{(-1)^k k!}{(1+x)^{k+1}}$

$= \frac{-(-1)^{k-1} (k-1)! k (1+x)^{-k-1}}{(1+x)^{2k}} = \frac{(-1)^k k!}{(1+x)^{k+1}} \quad \checkmark$

2.42