

Adam D.  
 Thomas S.  
 P. 770  
 29, 49, 51, 53  
 Calc II

1.770

$$\sum_{n=0}^{\infty} \frac{x^{2n}}{n!}$$

$$\sum_{n=0}^{\infty} \frac{(-x)^n}{n!}$$

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

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

49.  $\lim_{x \rightarrow 0} \frac{\sin x - x + \frac{1}{6}x^3}{x^9}$

$$\lim_{x \rightarrow 0} \frac{\sin x}{x^9} - \frac{x}{x^9} + \frac{x^3}{6x^9}$$

$$\lim_{x \rightarrow 0} \frac{\sin x}{x^9} - \lim_{x \rightarrow 0} \frac{x}{x^9} + \lim_{x \rightarrow 0} \frac{x^3}{6x^9}$$

$$= \lim_{x \rightarrow 0} \frac{(-1)^n x^{n+1}}{n!} - x + \frac{x^3}{6}$$

$$= \lim_{x \rightarrow 0} \frac{x - \frac{x^3}{6} + \frac{x^5}{120} - x + \frac{x^3}{6}}$$

$$= \lim_{x \rightarrow 0} \frac{x^5}{120} - \frac{x^5}{6} + \frac{x^3}{6}$$

$$= \frac{x}{120}$$

51.

Allison Wren  
Kristen  
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Pg. 770 27, 49, 51, 53

27.)  $f(x) = x^2 e^{-x}$

$$\sum_{n=0}^{\infty} \frac{-x^n}{n!}$$
$$x^2 \left( \frac{(-1)^n x^n}{n!} \right)$$

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

49.)  $\lim_{x \rightarrow 0} \frac{\sin x - x + \frac{1}{6}x^3}{x^5}$

$$\frac{x - \frac{x^3}{6} + \frac{x^5}{120} - x + \frac{1}{6}x^3}{x^5}$$

$$= \lim_{x \rightarrow 0} \frac{\frac{x^5}{120}}{x^5}$$

$$= \lim_{x \rightarrow 0} \frac{1}{120}$$

Group Work 4-14

pg. 770 27, 49, 51, 53

Andy Chleborad  
Turner Bost

(27)  $f(x) = x^2 e^{-x}$

$$e^{-x} = \left( \sum_{n=0}^{\infty} \frac{(-1)^n x^n}{n!} \right) \cdot x^2$$

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

(49)  $\lim_{x \rightarrow 0} \frac{\sin x - x + \frac{1}{6}x^3}{x^5}$

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!}$$

$$= \frac{-x - \frac{x^3}{3!} + \frac{x^5}{5!} - x + \frac{1}{6}x^3}{x^5}$$

$$= \frac{x}{5!} = \lim_{x \rightarrow 0} \frac{x^0}{5!} = \boxed{\frac{1}{120}}$$

(53)  $\frac{x}{\sin x}$