

$$13. \quad T_2(x) = 2 + \frac{1}{4}(x-4) - \frac{1}{64}(x-4)^2$$

$$|R_2(x)| \leq 0.000015625$$

$$f^3(x) = \frac{3}{8}x^{-\frac{5}{2}}$$

$$|f^3(x)| \text{ maximized at } x = 4$$

$$|R_2(x)| \leq \frac{|f^3(4)|}{3!} \cdot |0.2|^3$$

$$15. \quad T_3(x) = 1 + \frac{2}{3}(x-1) - \frac{1}{9}(x-1)^2 + \frac{4}{81}(x-1)^3$$

$$|R_3(x)| \leq 0.00009697$$

$$f^4(x) = -\frac{56}{81}x^{-\frac{13}{3}}$$

$$|f^4(x)| \text{ maximized at } x = 0.8$$

$$|R_3(x)| \leq \frac{|f^4(0.8)|}{4!} \cdot |0.2|^4$$

$$16. \quad T_4(x) = \frac{1}{2} - \frac{\sqrt{3}}{2}\left(x - \frac{\pi}{3}\right) - \frac{1}{4}\left(x - \frac{\pi}{3}\right)^2 + \frac{\sqrt{3}}{12}\left(x - \frac{\pi}{3}\right)^3 + \frac{1}{48}\left(x - \frac{\pi}{3}\right)^4$$

$$|R_4(x)| \leq 0.010495$$

$$f^5(x) = -\sin x$$

$$\text{Max of } |f^5(x)| = 1$$

$$|R_4(x)| \leq \frac{1}{5!} \cdot \left|\frac{\pi}{3}\right|^5$$

$$18. \quad T_3(x) = \ln 3 + \frac{2}{3}(x-1) - \frac{2}{9}(x-1)^2 - \frac{8}{81}(x-1)^3$$

$$|R_3(x)| \leq 0.015625$$

$$f^4(x) = -96(1+2x)^{-4}$$

$$|f^4(x)| \text{ maximized at } x = 0.5$$

$$|R_3(x)| \leq \frac{|f^4(0.5)|}{4!} \cdot |0.5|^4$$

$$20. \quad T_3(x) = (x-1) + \frac{1}{2}(x-1)^2 - \frac{1}{3!}(x-1)^3$$

$$|R_3(x)| \leq 0.0416666$$

$$f^4(x) = 2x^{-3}$$

$$|f^4(x)| \text{ maximized at } x = 0.5$$

$$|R_3(x)| \leq \frac{|f^4(0.5)|}{4!} \cdot |0.5|^4$$