

HW 10. §12.12

23. From Ex 5. $\sin x \approx \frac{1}{2} + \frac{\sqrt{3}}{2}(x - \frac{\pi}{6}) - \frac{1}{4}(x - \frac{\pi}{6})^2 - \frac{\sqrt{3}}{12}(x - \frac{\pi}{6})^3 = T_3(x)$

Using this approximation, $\sin 35^\circ \approx 0.57358$

The error should be $|R_3| \leq \frac{M}{4!} |x - \frac{\pi}{6}|^4$ where $|f^{(4)}(x)| \leq M$

Use the fact that $M \leq 1 \Rightarrow |R_3| \leq \frac{1}{24} (\frac{\pi}{36})^4 \approx 2.416 \times 10^{-6}$

$\Rightarrow$ The approximation used is within 5 decimal places.

25. $e^x = \sum_{n=0}^{\in$