P27-28

3. a. $150 \times 10^{-3} = 0.15$ ∴ the interval: $(149.85, 150.15)$

b. $900 \times 10^{-3} = 0.9$ ∴ the interval: $(899.1, 900.9)$

c. $1500 \times 10^{-3} = 1.5$ ∴ the interval: $(1498.5, 1501.5)$

d. $90 \times 10^{-3} = 0.09$ ∴ the interval: $(89.91, 90.09)$

11. a. $\lim_{x \to 0} f(x) = \frac{(\cos x + 1 - x\sin x) - \cos x}{1 - \cos x} = \frac{1 - x\sin x}{1 - \cos x} = \frac{-\sin x - x\cos x}{\sin x} = -2$

b. $f(0.1) = \frac{0.1 \times \cos(0.1) - \sin(0.1)}{0.1 - \sin 0.1} = -1.941$

c. $f(x) = \frac{x(1 - \frac{x^2}{2}) - (x - \frac{x^3}{6})}{x - x + \frac{x^3}{6}} = -2$ ∴ $f(0.1) = -2$

d. $E_1 = \frac{|f(0.1) - f'(0.1)|}{f'(0.1)} =$

$E_2 = \frac{|f(0.1) - f'(0.1)|}{f'(0.1)} : 0.0005 = 5 \times 10^{-4}$.

17. b. $x_1 = \frac{x_0 y_1 - x_1 y_0}{y_1 - y_0} = \frac{1.31 \times 4.76 - 3.24 \times 1.53}{4.76 - 3.24} = -0.00658$

$x_2 = x_1 - \frac{(x_1 - x_0) y_0}{y_1 - y_0} = 1.93 - \frac{(1.93 - 1.31) \times 4.76}{4.76 - 3.24} = -0.01$

$E_1 = \frac{|x_0 - x_1|}{x_0} = 0.428$ $E_2 = \frac{(x_0 - x_2)}{x_0} = 0.130$

∴ The second way is better.

P38.

7.