Answers DDB 04-3

1. (a) $1 - \frac{x^3}{2} + \frac{3x^6}{8} - \frac{5x^9}{16}$

(b) 0.4926 Error $<$ 0.00003052

2. (i) $(1, 5]$ (ii) $-\frac{5}{8}$

3. (a) $p_3(x) = (x-1) + \frac{(x-1)^2}{2} - \frac{(x-1)^3}{6}$

$R_3(x) = \frac{\max f^{(4)}(z)}{4!}(x-1)^4 \qquad z \in (1, x)$

(b) Error $< \frac{1}{24} = 0.04167$

4. (a) $1 - x + \frac{x^2}{2} - \frac{x^3}{2} + \frac{13}{24}x^4 \qquad |x| < 1$ (R=1)

(b) $\frac{1}{2}\sum_{n=0}^{\infty} \frac{(x+2)^n}{6^n} \qquad |x+2| < 6$ (R=6)

5. (i) $\frac{dy}{dx} = \frac{3t^2-4}{2t}$

$\frac{d^2y}{dx^2} = \frac{3t^2+4}{4t^3}$

(ii) $m_T = 0$ @ $(4/3, -16/3\sqrt{3})$ & $(4/3, 16/3\sqrt{3})$

m_T = und @ $(0,0)$

(iii)