

chp 4 p 310 # 53-57

$$53) f'(x) = x^{5/2} - 4x^{-1/5}$$
$$f(x) = \frac{2}{7}x^{7/2} - 5x^{4/5} + C$$

$$54) f'(x) = 8x - 3\sec^2 x$$
$$f(x) = 4x^2 - 3\tan x + C$$

$$55) f'(t) = 2t - 3\sin t$$
$$f(t) = t^2 + 3\cos t + C$$

$$56) f'(u) = u + u^{-1/2}$$
$$f(u) = \frac{1}{2}u^2 + 2u^{1/2} + C$$
$$3 = \frac{1}{2} + 2 + C, C = \frac{1}{2}$$

$$57) f''(x) = 1 - 6x + 48x^2$$
$$f'(x) = x - 3x^2 + 16x^3 + C$$
$$f'(0) = 2 = 0 - 0 + 0 + C, C = 2$$

$$\therefore f'(x) = x - 3x^2 + 16x^3 + 2$$

$$f(x) = \frac{1}{2}x^2 - x^3 + 4x^4 + 2x + D$$

$$f(0) = 1 = 0 - 0 + 0 + 0 + D, D = 1$$

$$\therefore f(x) = \frac{1}{2}x^2 - x^3 + 4x^4 + 2x + 1$$

chp 5 p 370 # 33, 35, 37, 44-47

$$33) F'(x) = \sqrt{1+x^4} \quad 35) g'(x) = \frac{x^3}{\sqrt{1+(x^3)^3}} \cdot 3x^2$$
$$= \frac{3x^5}{\sqrt{1+x^9}}$$

$$37) y = \int_0^x \frac{\cos \theta}{\theta} d\theta + \int_{\sqrt{x}}^0 \frac{\cos \theta}{\theta} d\theta$$
$$y = \int_0^x \frac{\cos \theta}{\theta} d\theta - \int_0^{\sqrt{x}} \frac{\cos \theta}{\theta} d\theta$$

$$y' = \frac{\cos x}{x} - \frac{\cos \sqrt{x}}{\sqrt{x}} \cdot \frac{1}{2}x^{-1/2} = \frac{\cos x}{x} - \frac{\cos \sqrt{x}}{2x}$$

$$44) v(t) = t^2 - t = t(t-1) = 0$$

$$t = 0, 1$$

$$a) \text{ Displacement} = \int_0^5 v(t) dt = \left. \frac{1}{3}t^3 - \frac{1}{2}t^2 \right|_0^5 = \frac{1}{3}(5)^3 - \frac{1}{2}(5)^2 - [0-0]$$

$$= \frac{175}{6} \approx 29.166 \text{ meters}$$

$$b) \text{ Total Distance} = \int_0^5 |v(t)| dt = -\int_0^1 t^2 - t dt + \int_1^5 t^2 - t dt$$

$$= \left(\frac{1}{3}t^3 - \frac{1}{2}t^2 \right) \Big|_0^1 + \left(\frac{1}{3}t^3 - \frac{1}{2}t^2 \right) \Big|_1^5$$

$$= -\left(\frac{1}{3} - \frac{1}{2} \right) + \left(\frac{125}{3} - \frac{25}{2} - \left[\frac{1}{3} - \frac{1}{2} \right] \right)$$

$$= \frac{177}{6} \approx 29.5 \text{ meters}$$

45) $\int_0^3 r(t) dt$ represents the # of barrels consumed from Jan 2000 to Jan 2003.

$$46) M_5 = 1(4.67 + 8.86 + 10.22 + 10.67 + 10.81)$$

$$= 45.23 \text{ m} \approx \int_0^5 r(t) dt$$

$$47) M_6 \approx 4[r(2) + r(6) + r(10) + r(14) + r(18) + r(22)]$$

$$\approx 4[50 + 1000 + 7000 + 8550 + 1350 + 1800]$$

$$\approx 72,400 \text{ bees} \approx \int_0^{24} r(t) dt$$

chp 6 p 407 #30

$$30) f_{\text{ave}} = \frac{1}{10-0} \int_0^{10} t \sin(t^2) dt = 0.007$$

chp 8 p 578 #67 using trapezoid rule

↙ need time in hours $1 \text{ min} = \frac{1}{60} \text{ hr}$

$$67) \int_0^{10} v(t) dt \approx \frac{1}{2} \left(\frac{1}{60} \right) [40 + 2(42) + 2(45) + 2(49) + 2(52) + 2(54) +$$