CH6 HW [DAY 100] §6.2
p.330 #27, 37-50   p.323 #12,19

(27) $g(x) = \dfrac{5}{x^3} = 5x^{-3}$

$\displaystyle\int 5x^{-3}\,dx = \dfrac{5}{-2}x^{-2} + c = \dfrac{-5}{2x^2} + c$

(31) $\displaystyle\int 5x+7\,dx = \dfrac{5}{2}x^2 + 7x + c$

(38) $\displaystyle\int \left(4t + \dfrac{1}{t}\right)dt = 2t^2 + \ln|t| + c$

(39) $\displaystyle\int (2+\cos t)\,dt = 2t + \sin t + c$

(40) $\displaystyle\int 7e^x\,dx = 7e^x + c$

(41) $\displaystyle\int (3e^x + 2\sin x)\,dx = 3e^x - 2\cos x + c$

(42) $\displaystyle\int (4e^x - 3\sin x)\,dx = 4e^x - 3\cos x + c$

(43) $\displaystyle\int (5x^2 + 2\sqrt{x})\,dx = \dfrac{5}{3}x^3 + \dfrac{4}{3}x^{\frac{3}{2}} + c$

(44) $\displaystyle\int (x+3)^2\,dx = \int (x^2 + 3x + 9)\,dx = ?$
$$= \boxed{\dfrac{1}{3}x^3 + \dfrac{3}{2}x^2 + 9x + c}$$

(45) $\displaystyle\int 8x^{-\frac{1}{2}}\,dx = 16\sqrt{x} + c$

(46) $\displaystyle\int \left(\dfrac{3}{t} - 2t^{-2}\right)dt = 3\ln|t| + \dfrac{2}{t} + c$

(47) $\displaystyle\int (e^x + 5)\,dx = e^x + 5x + c$

(48) $\displaystyle\int t^3(t^2+1)\,dt = \int t^5 + t^3\,dt = \dfrac{t^6}{6} + \dfrac{t^4}{4} + c$

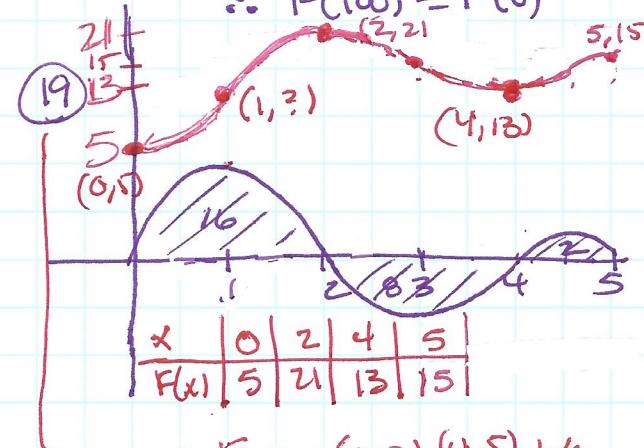(49) $\displaystyle\int \left(\sqrt{x^3} - \dfrac{2}{x}\right)dx = \int x^{\frac{3}{2}} - \dfrac{2}{x}\,dx = \dfrac{2}{5}x^{\frac{5}{2}} - 2\ln|x| + c$

(50) $\displaystyle\int \dfrac{x+1}{x}\,dx = \int 1 + \dfrac{1}{x}\,dx = x + \ln|x| + c$

(12) $\displaystyle\int_2^5 f(x)\,dx = 4$
$F(5) = 10 \quad F(2) = ?$

a) $\displaystyle\int_2^5 f(x)\,dx = F(5) - F(2) = 4$
$10 - F(2) = 4$
$\therefore 6 = F(2)$

b) $\displaystyle\int_0^{100} f(x)\,dx = 0$
$0 = F(100) - F(0)$
$\therefore F(100) = F(0)$

(19)

x	0	2	4	5
F(x)	5	21	13	15

F inc (0,2)(4,5) b/c
   F' = f > 0
F dec (2,4) b/c
   F' = f < 0
F cc up (0,1)(3, 4.5)
   b/c F' = f inc
F cc down (1,3)(4.5,5)
   b/c F' = f dec