LSN 6 HW

5.4

INDEF ∫'s

Net Chg Thm

5.4 20) $\int (e^x - 2x^2)\,dx = e^x - 2\left(\frac{1}{3}x^3\right) + C$

21) $\int_{-2}^{3} (x^2 - 3)\,dx = \frac{1}{3}x^3 - 3x + C \Big]_{-2}^{3} = \left(\frac{1}{3}27 - 9\right) - \left(\frac{1}{3}(-8) + 6\right)$

$0 + \frac{8}{3} - 6 = \frac{8}{3} - \frac{18}{3} = \boxed{-\frac{10}{3}}$

24) $\int_{0}^{3} (1 + 6w^2 - 10w^4)\,dw = \left(w + 6\left(\frac{1}{3}w^3\right) - 10\left(\frac{1}{5}w^5\right) + C\right)\Big]_{0}^{3}$

$= (3 + 2(27) - 2(243) + C) - (0 + 0 - 0 + C)$

$= 3 + 54 - 486 = \boxed{-429}$

28) $\int_{1}^{2} (x^{-2} - 4x^{-3})\,dx = \left(\frac{1}{-1}x^{-1} - 4\left(\frac{1}{-2}x^{-2}\right) + C\right)\Big]_{1}^{2}$

$\left(-\frac{1}{2} + 2\left(\frac{1}{4}\right)\right) - \left(-\frac{1}{1} + 2\right)$

$= -\frac{1}{2} + \frac{1}{2} + 1 - 2 = \boxed{-1}$

31) $\int_{0}^{1} x\left(\sqrt[3]{x} + \sqrt[4]{x}\right)dx = \int_{0}^{1} \left(x^{4/3} + x^{5/4}\right)dx = \left[\frac{3}{7}x^{7/3} + \frac{4}{9}x^{9/4} + C\right]_{0}^{1}$

$= \left(\frac{3}{7}(1) + \frac{4}{9}(1)\right) - 0 = \frac{27}{63} + \frac{28}{63} = \boxed{\frac{56}{63}}$

52) $\omega'(t) = \Delta\omega t/\Delta s$ $\omega(t)$

53)

18) $\int \frac{\sin 2x}{\sin x}\,dx = \int \frac{2\sin(x)\cos(x)}{\sin(x)}\,dx$ (double ang. theorem)

$2\int \cos(x)\,dx = \boxed{2\sin(x) + C}$

53) $I = Q'(t)$ I = current Q = charge $\frac{dQ}{dt} = \frac{\Delta \text{charge}}{\Delta t}$

$\int_{a}^{b} I(t)\,dt = Q(t) + C\Big]_{a}^{b}$ change in charge for $t = a$ to b

54) $100 + \int_{0}^{15} n'(t)\,dt = 100 +$ Δ bees from week 0–15