HW 6.4 p. 311 <u>28-44 even, 45, 47</u>

Thursday, January 29, 2015 11:30 AM

(28) $\int_2^{-1} 3^x dx = \frac{3^x}{\ln 3}\Big|_2^{-1} = \frac{3^{-1}}{\ln 3} - \frac{3^2}{\ln 3} = \boxed{\frac{1}{3\ln 3} - \frac{9}{\ln 3} \approx -7.889}$

(30) $\int_0^5 x^{\frac{3}{2}} dx = \frac{2}{5}x^{\frac{5}{2}}\Big|_0^5 = \frac{2}{5}\left(5^{\frac{5}{2}} - 0^{\frac{5}{2}}\right) = \frac{2}{5}\cdot 5^{\frac{5}{2}} = \frac{2}{5}\left(\sqrt{5^5}\right) = \frac{2}{5}\left(5^2\sqrt{5}\right) = \boxed{10\sqrt{5}}$

(32) $\int_{-2}^{-1} \frac{2}{x^2} dx = 2\left(-\frac{1}{x}\right)\Big|_{-2}^{-1} = \frac{-2}{x}\Big|_{-2}^{-1} = \frac{-2}{-1} - \frac{-2}{-2} = \boxed{1}$

(34) $\int_0^{\pi} (1+\cos x) dx = (x + \sin x)\Big|_0^{\pi} = (\pi + \sin\pi) - (0 + \sin 0)$

$= \boxed{\pi}$

(36) $\int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} \csc^2\theta \, d\theta = (-\cot\theta)\Big|_{\frac{\pi}{6}}^{\frac{5\pi}{6}} = -\left(\cot\frac{5\pi}{6} - \cot\frac{\pi}{6}\right) =$

$= -\left(-\sqrt{3} - \sqrt{3}\right) = \boxed{2\sqrt{3}}$

(38) $\int_0^{\frac{\pi}{3}} 4\sec x \tan x \, dx = 4\sec x\Big|_0^{\frac{\pi}{3}} = 4\left(\sec\frac{\pi}{3} - \sec 0\right) = 4(2-1) = \boxed{4}$

(40) $\int_0^4 \frac{1-\sqrt{u}}{\sqrt{u}} du = \int_0^4 \left(\frac{1}{\sqrt{u}} - 1\right) du = \int_0^4 \left(u^{-\frac{1}{2}} - 1\right) du = \left(2u^{\frac{1}{2}} - x\right)\Big|_0^4$

$= (2\sqrt{4} - 4) - (0)$

$= \boxed{0}$

(42) $\int_{-2}^{2} (3x^2 - 3) dx = (x^3 - 3x)\Big|_{-2}^{2} = \left(2^3 - 3(2)\right) - \left((-2)^3 - 3(-2)\right)$

$= 2 - (-2)$

$= \boxed{4}$

(44) $\int_{-2}^{2} (x^3 - 4x) dx = \left(\frac{1}{4}x^4 - 2x^2\right)\Big|_{-2}^{2} = \left(\frac{1}{4}(2)^4 - 2(2)^2\right) - \left(\frac{1}{4}(-2)^4 - 2(-2)^2\right)$

$= (4-8) - (4-8)$

$= \boxed{0}$

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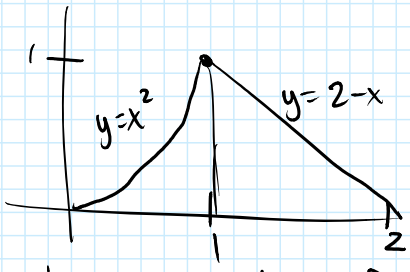

$$\int_0^1 x^2\,dx + \frac{1}{2}(1)(1)$$

$$= \frac{1}{3}x^3\Big|_0^1 + \frac{1}{2}$$

$$= \frac{1}{3}(1-0) + \frac{1}{2} = \boxed{\frac{5}{6}}$$

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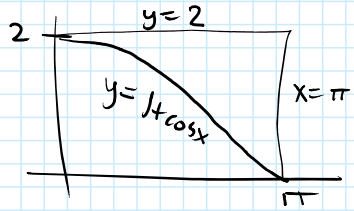

$$A_{SH} = 2\pi - \int_0^{\pi} (1+\cos x)\,dx$$

$$= 2\pi - \pi \quad \leftarrow \text{(see \#34)}$$

$$= \boxed{\pi}$$