

Ch. 4.3-4.4a Definite Integrals p. 273-275

#13-21 odd, 33-39 odd, 47, 49
p. 288-289 #5-33 odd**4.3**

Use properties of definite integrals:

$$\int_2^4 x^3 dx = 60 \quad \int_2^4 x dx = 6 \quad \int_2^4 dx = 2$$

$$37) \int_2^4 (x-9) dx = \int_2^4 x dx - \int_2^4 9 dx \rightarrow 9x \Big|_2^4 = 9(4) - 9(2) = 36 - 18 = 18$$

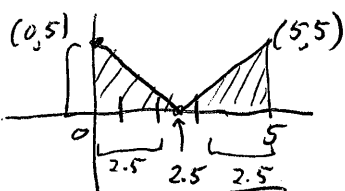
$$\rightarrow 6 - 18 = \boxed{-12}$$

$$39) \int_2^4 \left(\frac{1}{2}x^3 - 3x + 2 \right) dx = \frac{1}{2} \int_2^4 x^3 dx - 3 \int_2^4 x dx + \int_2^4 2 dx \rightarrow 2x \Big|_2^4 = 2(4) - 2(2) = 8 - 4 = 4$$

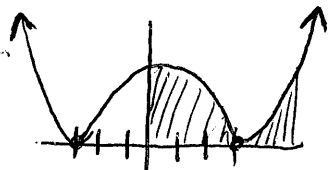
$$\frac{1}{2}(60) - 3(6) + 4 = 30 - 18 + 4 = \boxed{16}$$

Ch. 4.4a p. 288-289 #5-33 odd

$$\begin{aligned}
 15) \int_1^4 \frac{u-2}{\sqrt{u}} du &= \int (u-2)u^{-1/2} du = \int u^{1/2} - 2u^{-1/2} du \\
 &= \left[\frac{u^{3/2}}{3/2} - \frac{2u^{1/2}}{1/2} \right]_1^4 = \frac{2}{3}(4)^{3/2} - 4(4)^{1/2} - \left[\frac{2}{3}(1) - 4(1) \right] \\
 &= \frac{2}{3}(8) - 4(2) - \frac{2}{3} + 4 = \frac{14}{3} - 4 = \frac{14}{3} - \frac{12}{3} = \boxed{\frac{2}{3}}
 \end{aligned}$$

$$23) \int_0^5 |2x-5| dx$$


$$= \frac{1}{2}(5)(2.5) + \frac{1}{2}(2.5)(5) = \boxed{\frac{25}{2}}$$

$$25) \int_0^4 |x^2-9| dx$$


$$|x^2-9| = \begin{cases} 9-x^2, & -3 < x < 3 \\ x^2-9, & x > 3 \end{cases}$$

$$\int_0^3 9-x^2 dx + \int_3^4 x^2-9 dx \rightarrow \left[\frac{x^3}{3} - 9x \right]_3^4 = \frac{4^3}{3} - 9(4) - \left(\frac{27}{3} - 27 \right)$$

$$\left[9x - \frac{x^3}{3} \right]_0^3 = 9(3) - \frac{3^3}{3} - (0-0) = 27-9 + \frac{64}{3} - 36 - 9 + 27 = \boxed{\frac{64}{3}}$$

$$31) \int_{-\pi/6}^{\pi/6} \sec^2 x dx = \tan x \Big|_{-\pi/6}^{\pi/6} = \tan(\pi/6) - \tan(-\pi/6) = \frac{\sqrt{3}}{3} - \left(-\frac{\sqrt{3}}{3} \right) = \boxed{\frac{2\sqrt{3}}{3}}$$

$$33) \int_{-\pi/3}^{\pi/3} 4 \sec \theta \tan \theta d\theta = 4 \sec \theta \Big|_{-\pi/3}^{\pi/3} = 4 \sec(\pi/3) - 4 \sec(-\pi/3) = 4(2) - 4(2) = \boxed{0}$$