

$$1. A = \int_{x=0}^{x=4} (y_T - y_B) dx = \int_0^4 [(5x - x^2) - x] dx = \int_0^4 (4x - x^2) dx$$

$$= [2x^2 - \frac{1}{3}x^3]_0^4 = (32 - \frac{64}{3}) - (0) = \frac{32}{3}$$

$$2. A = \int_0^2 \left( \sqrt{x+2} - \frac{1}{x+1} \right) dx = \left[ \frac{2}{3}(x+2)^{3/2} - \ln(x+1) \right]_0^2$$

$$= \left[ \frac{2}{3}(4)^{3/2} - \ln 3 \right] - \left[ \frac{2}{3}(2)^{3/2} - \ln 1 \right] = \frac{16}{3} - \ln 3 - \frac{4}{3}\sqrt{2}$$

$$3. A = \int_{y=-1}^{y=1} (x_R - x_L) dy = \int_{-1}^1 [e^y - (y^2 - 2)] dy$$

$$= \int_{-1}^1 (e^y - y^2 + 2) dy = [e^y - \frac{1}{3}y^3 + 2y]_{-1}^1 = (e^1 - \frac{1}{3} + 2) - (e^{-1} + \frac{1}{3} - 2) = e - \frac{1}{e} + \frac{10}{3}$$

$$4. A = \int_0^3 [(2y - y^2) - (y^2 - 4y)] dy = \int_0^3 (-2y^2 + 6y) dy$$

$$= [-\frac{2}{3}y^3 + 3y^2]_0^3 = (-18 + 27) - 0 = 9$$

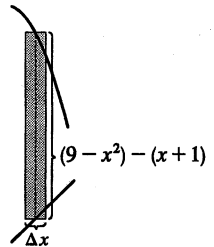
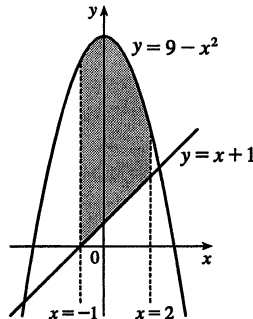
$$5. A = \int_{-1}^2 [(9 - x^2) - (x + 1)] dx$$

$$= \int_{-1}^2 (8 - x - x^2) dx$$

$$= \left[ 8x - \frac{x^2}{2} - \frac{x^3}{3} \right]_{-1}^2$$

$$= (16 - 2 - \frac{8}{3}) - (-8 - \frac{1}{2} + \frac{1}{3})$$

$$= 22 - 3 + \frac{1}{2} = \frac{39}{2}$$



$$6. A = \int_0^{\pi/2} (e^x - \sin x) dx$$

$$= [e^x + \cos x]_0^{\pi/2}$$

$$= (e^{\pi/2} + 0) - (1 + 1)$$

$$= e^{\pi/2} - 2$$

