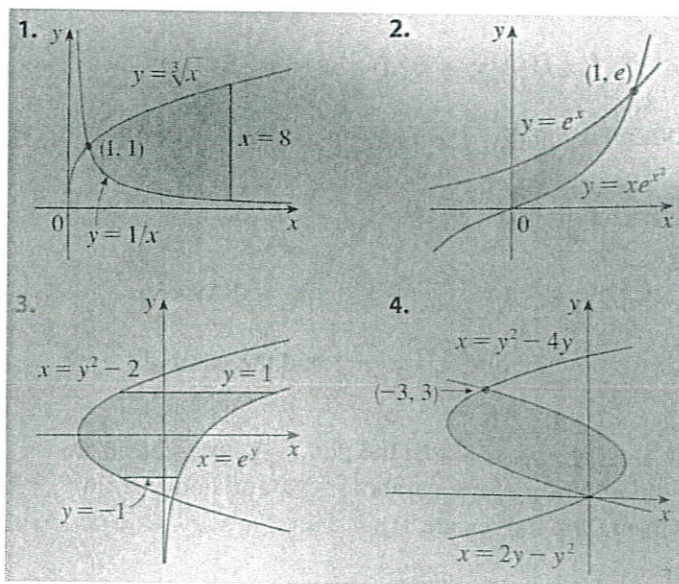## Quiz #19

1. Formulate the definite integral to find the area of the shaded region of
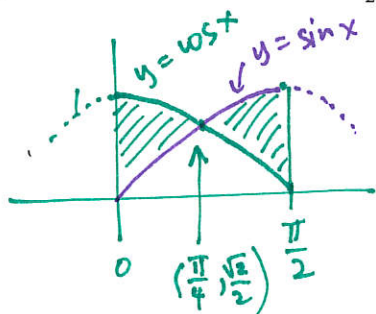
    a. Figure 1. $A = \int_{1}^{8}\left(\sqrt[3]{x} - \frac{1}{x}\right)dx$ [2]

    b. Figure 2. $A = \int_{0}^{1}\left(e^{x} - xe^{x^{2}}\right)dx$ [2]

    c. Figure 3. $A = \int_{-1}^{1}\left(e^{y} - (y^{2} - 2)\right)dy$ [2]

    d. Figure 4.   [2]

$$A = \int_{0}^{3}\left((2y - y^{2}) - (y^{2} - 4y)\right)dy$$

2. Formulate the definite integral to find the are of the region enclosed by the curves $y = \sin x$ and $y = \cos x$ from $x = 0$ to $x = \frac{\pi}{2}$.

$$A = \int_{0}^{\pi/4}(\cos x - \sin x)dx + \int_{\pi/4}^{\pi/2}(\sin x - \cos x)dx$$

$$= 2\int_{0}^{\pi/4}(\cos x - \sin x)dx \qquad \text{due to symmetry.}$$