7.2

(19) $y = x\sqrt{a^2 - x^2}$ and $y = 0 \leftarrow$ x-axis $\boxed{a > 0}$

$-\frac{1}{2}\int_0^a x\sqrt{a^2-x^2}\,dx\,[-2]$ du

$x\sqrt{a^2-x^2} = 0$

$x = 0$ $\quad \sqrt{a^2-x^2}^{\,2} = \sqrt{0}^{\,2}$

$a = x$

$u = a^2 - x^2$

$du = -2x\,dx$

$-\frac{1}{2}\int_{a^2}^{0} u^{1/2}\,du$

$\frac{1}{2}\int_0^{a^2} u^{1/2}\,du$

$\frac{1}{2}\Big|_0^{a^2} \frac{2}{3}u^{3/2}$

$\frac{1}{\cancel{2}}\cdot\frac{\cancel{2}}{3}\left[(a^2)^{3/2} - 0\right]$

$\frac{1}{3}a^3 \times 2 = \boxed{\frac{2}{3}a^3}$

7.2

(11) $y^2 = x+1$; $y^2 = 3-x$

$a = -1.414214$

$b = 1.414214$

$x^2 = y+1$ $\quad x^2 = 3-y$

$x^2 - 1 = y$ $\quad y = 3 - x^2$

$\int_a^b$

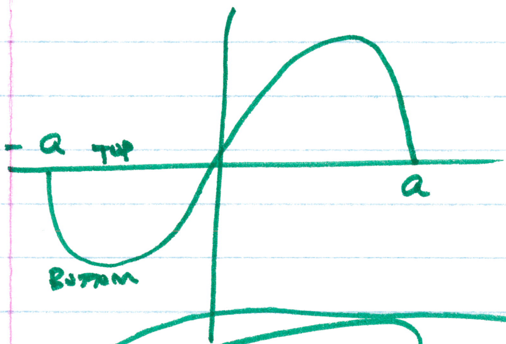
(19) $y = x\sqrt{a^2-x^2}$; $y = 0$

$\int_{-a}^{0} \left(0 - x\sqrt{a^2-x^2}\right) dx +$

$\Big|_{-a}^{0} + \frac{1}{3}(a^2-x^2)^{3/2}$

$\left[+\frac{1}{3}(a^2-0^2)^{3/2} + \cancel{\frac{1}{3}(a^2-(-a)^2)^{3/2}}\right]$

$\int_0^a x\sqrt{a^2-x^2}\, dx$



$-\frac{1}{2}\int x\sqrt{a^2-x^2}\, dx \; [-2]$ $\quad du$

$u = a^2 - x^2$

$du = -2x\, dx$

$-\frac{1}{2}\int \sqrt{u}\, du$

$-\frac{1}{2}\int u^{1/2}\, du$

$-\frac{1}{2} \cdot \frac{2}{3} u^{3/2}$

$-\frac{1}{3} u^{3/2}$

$-\frac{1}{3}(a^2-x^2)^{3/2}$

$+\frac{1}{3}(a^2)^{3/2} = +\frac{1}{3}a^3$

$\times 2$

$\frac{2}{3}a^3$

7.2

(23) $y^2 - 4x = 4$, $4x - y = 16$

$x^2 - 4y = 4$ $\quad$ $4y - x = 16$

$-x^2 \quad -x^2$ $\quad$ $+x \quad +x$

$\frac{-4y}{-4} = \frac{-x^2}{-4} \frac{+4}{-4}$ $\quad$ $\frac{4y}{4} = \frac{x+16}{4}$

$g(x)$ $y = \frac{x^2}{4} - 1$ $\quad$ $y = \frac{x}{4} + 4 = f(x)$

$$\int_{-4}^{5} \left[\left(\frac{x}{4}+4\right) - \left(\frac{x^2}{4}-1\right)\right] dx = 30.375$$

$$\int_{-4}^{5} \left[f(x) - g(x)\right] dx = 30.375$$

7.2

(9) $\int_0^1 \left(x - \frac{x^2}{4}\right) dx + \int_1^2 \left(1 - \frac{x^2}{4}\right) dx$

(37) $x - y^3 = 0$ $\qquad x - y = 0$

$y - x^3 = 0$ $\qquad y - x = 0$

$y = x^3$ $\qquad y = x$