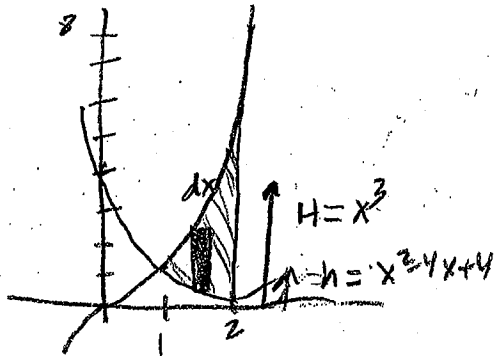


# Review for Unit 6, Part 1 Test

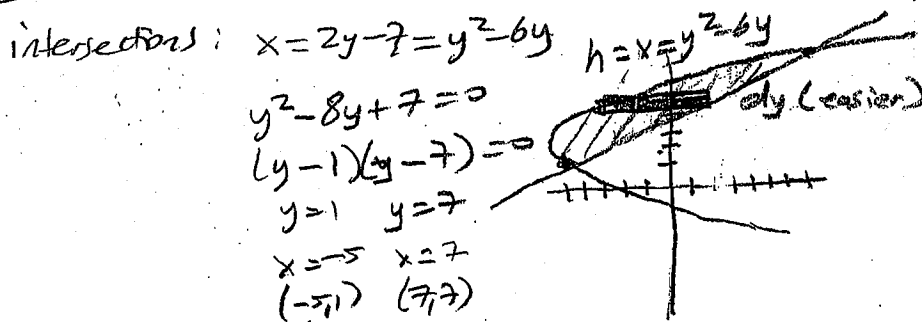
(1) area,  $y=x^3$ ,  $y=x^2-4x+4$ ,  $x=2$



$$A = \int (H-h) dx$$

$$= \int_1^2 [x^3 - (x^2 - 4x + 4)] dx$$

(2) area,  $x-2y+7=0$ ,  $y^2-6y-x=0$

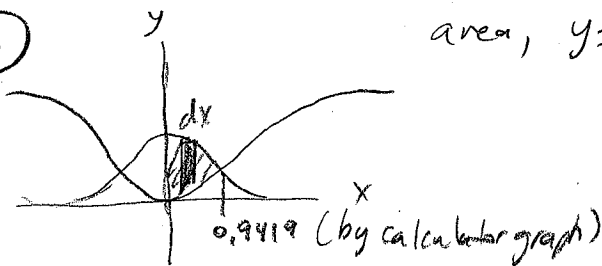


$$H = x = 2y - 7$$

$$A = \int (H-h) dy$$

$$= \int_1^7 [(2y-7) - (y^2-6y)] dy$$

(3)

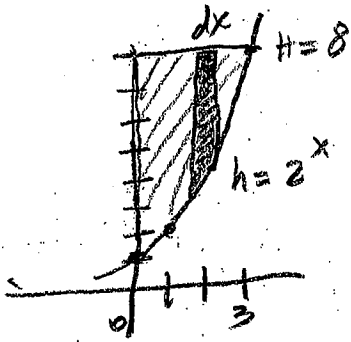


area,  $y=e^{-x^2}$ ,  $y=1-\cos(x)$ ,  $x=0$

$$A = \int (H-h) dx$$

$$= \int_0^{0.914} [e^{-x^2} - (1 - \cos(x))] dx$$

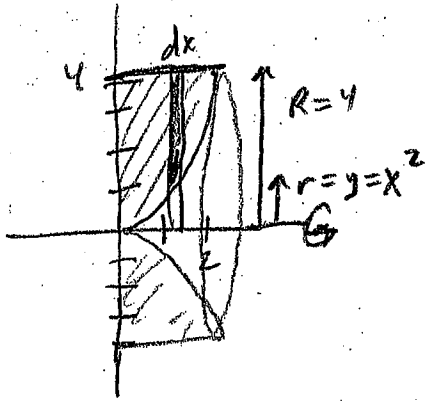
(4) area,  $y=2^x$ ,  $y=8$ ,  $x=0$



$$A = \int (H-h) dw$$

$$= \int_0^3 [8 - 2^x] dx$$

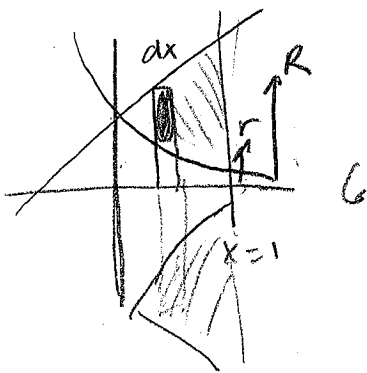
(5) volume,  $y=x^2$ ,  $y=4$ ,  $x=0$ , about x-axis, disc



$$V = \int \pi (R^2 - r^2) dh$$

$$= \int_0^2 \pi [16 - (x^2)^2] dx$$

(6) volume,  $y=e^{-2x}$ ,  $y=1+x$ ,  $x=1$  about x-axis disc



$$R = 1+x$$

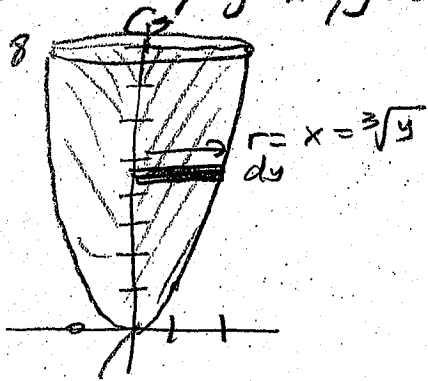
$$r = e^{-2x}$$

$$V = \int \pi R^2 dh - \int \pi r^2 dh$$

$$= \int_0^1 \pi (1+x)^2 dx - \int_0^1 \pi (e^{-2x})^2 dx$$

$$= \pi \int_0^1 [(1+x)^2 - (e^{-2x})^2] dx$$

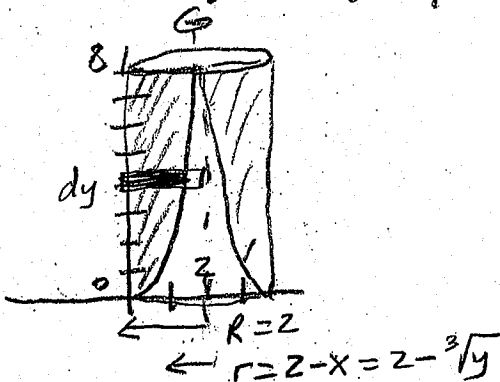
(7) volume,  $y=x^3$ ,  $y=8$ ,  $x=0$ , about  $y$ -axis, disc



$$V = \int \pi r^2 dh$$

$$= \int_0^8 \pi (\sqrt[3]{y})^2 dy$$

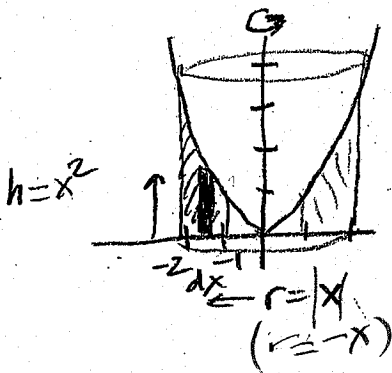
(8) volume,  $y=x^3$ ,  $y=8$ ,  $x=0$ , about  $x=2$ , disc



$$V = \int \pi [R^2 - r^2] dh$$

$$= \int_0^8 \pi [4 - (2 - \sqrt[3]{y})^2] dy$$

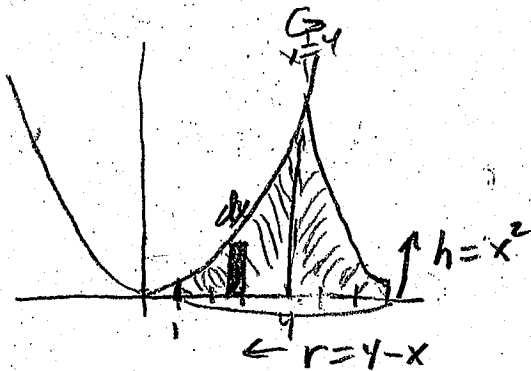
(9) volume,  $y=x^2$ ,  $y=0$ ,  $x=-2$ ,  $x=-1$ , about  $y$ -axis, shell



$$V = \int 2\pi r h dr$$

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

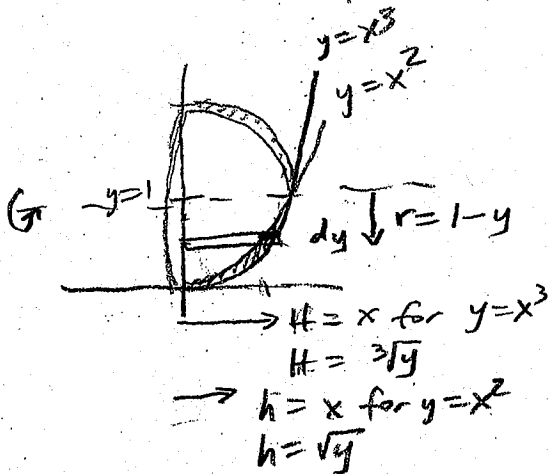
(10) volume  $y=x^2$ ,  $y=0$ ,  $x=1$ ,  $x=4$ , about  $x=4$ , shell



$$V = \int 2\pi r h dr$$

$$= \int_1^4 2\pi (4-x)(x^2) dx$$

(11) volume,  $y=x^3$ ,  $y=x^2$ , about  $y=1$ , shell



$$V = \int 2\pi r (H-h) dr$$

$$= \int_0^1 2\pi (1-y)(\sqrt[3]{y} - \sqrt{y}) dy$$

(12) volume,  $x+3=4y-y^2$ ,  $x=0$ , about  $x$ -axis, shell

intersections:  $(x=4y-y^2-3)$

$$(0)+3=4y-y^2$$

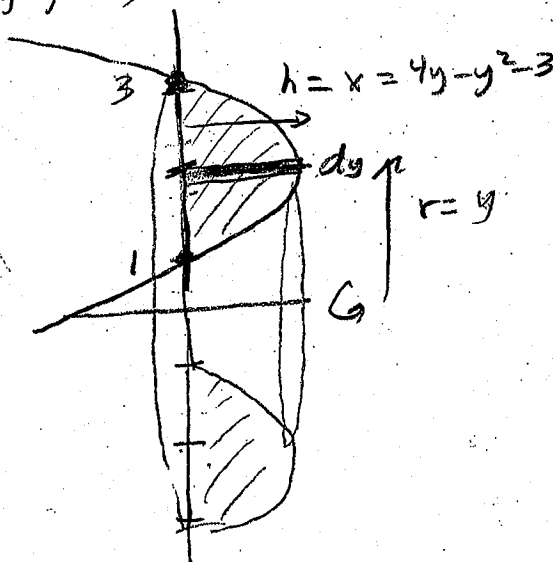
$$y^2-4y+3=0$$

$$(y-1)(y-3)=0$$

$$y=1 \quad y=3$$

$$x=0 \quad x=0$$

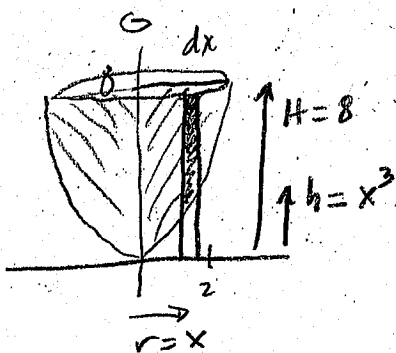
$$(0,1) \quad (0,3)$$



$$V = \int 2\pi r h dr$$

$$= \int_1^3 2\pi y(4y-y^2-3) dy$$

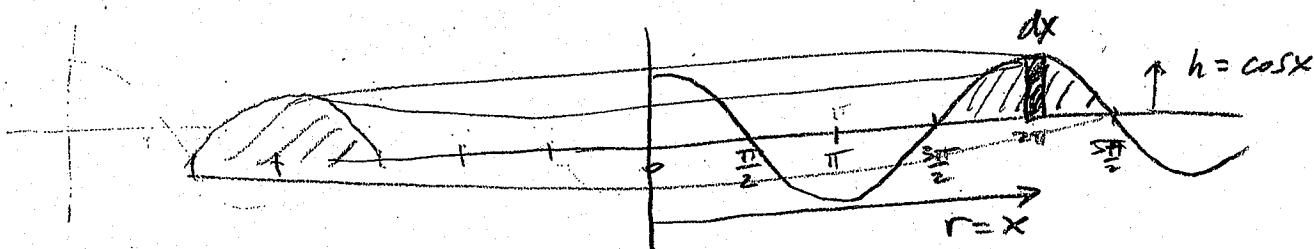
(13) volume,  $y = x^3$ ,  $y = 8$ ,  $x = 0$ , about y-axis, shell



$$V = \int 2\pi r (H-h) dr$$

$$= \int_0^2 2\pi (x) [8 - x^3] dx$$

(14) volume,  $y = \cos x$ ,  $y = 0$ ,  $x = \frac{3\pi}{2}$ ,  $x = \frac{5\pi}{2}$ , about y-axis, shell



$$V = \int 2\pi r h dx$$

$$= \int_{\frac{3\pi}{2}}^{\frac{5\pi}{2}} 2\pi x (\cos x) dx$$