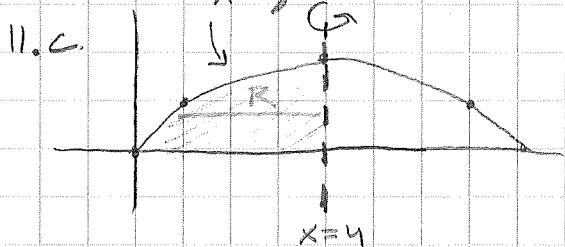


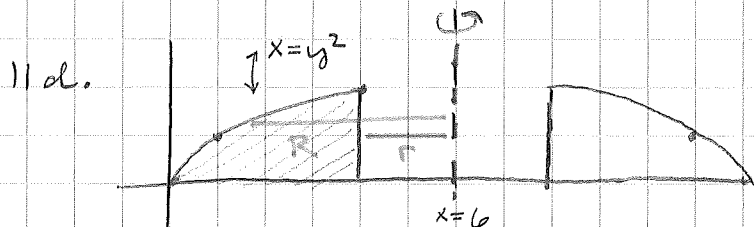
7-#4: ⁴⁶³ 11c, 12c, 13b, 14b, 15, 16, 18, 19, 22, 52a and Extra



$$R = 4 - y^2$$

$$A = \pi(4 - y^2)^2 = \pi(16 - 8y^2 + y^4)$$

$$V = \pi \int_0^2 (16 - 8y^2 + y^4) dy = \boxed{\frac{256\pi}{15}}$$



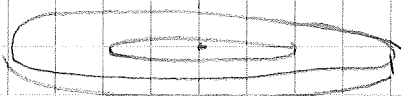
$$R = 6 - y^2$$

$$r = 6 - 4 = 2$$

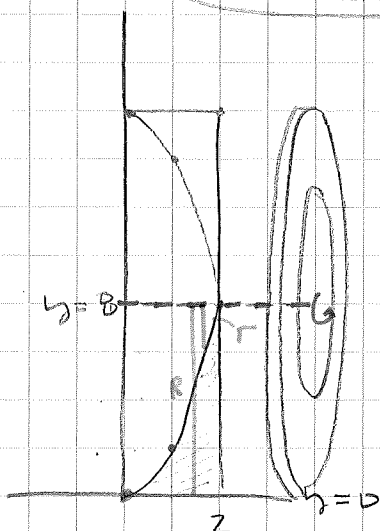
$$A = \pi(6 - y^2)^2 - \pi(2)^2 = \pi[36 - 24y^2 + y^4 - 4]$$

$$= \pi[32 - 24y^2 + y^4]$$

$$V = \pi \int_0^2 (32 - 24y^2 + y^4) dy = \boxed{\frac{192\pi}{5}}$$



12c.



$$R = 8 - 0 = 8$$

$$r = 8 - 2x^2$$

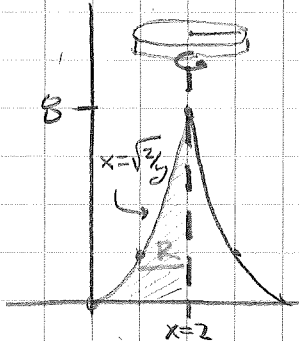
$$A = \pi(8)^2 - \pi(8 - 2x^2)^2 = \pi[64 - 64 + 32x^2 + 4x^4]$$

$$= \pi[4x^4 + 32x^2]$$

$$= 4\pi[-x^4 + 8x^2]$$

$$V = 4\pi \int_0^2 (-x^4 + 8x^2) dx = \boxed{\frac{896\pi}{15}}$$

12d.



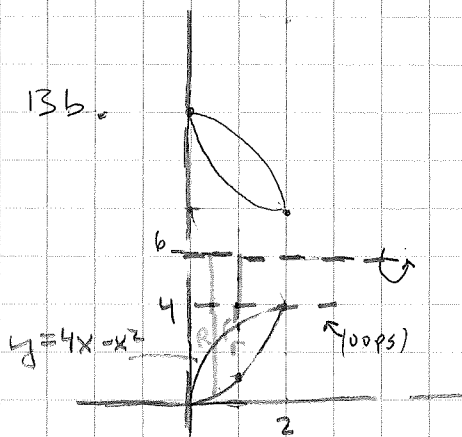
$$R = 2 - \sqrt{y/2}$$

$$A = \pi(2 - \sqrt{y/2})^2 \rightarrow \pi \int_0^8 (2 - \sqrt{y/2})^2 dy$$

$$= \pi(4 - 4\sqrt{y/2} + y/2)$$

$$V = \pi \int_0^8 (4 - 2\sqrt{2}y^{1/2} + 1/2y) dy = \boxed{16\pi/3}$$

13b.

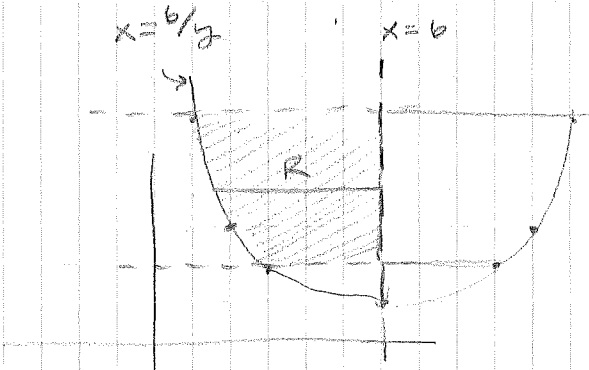


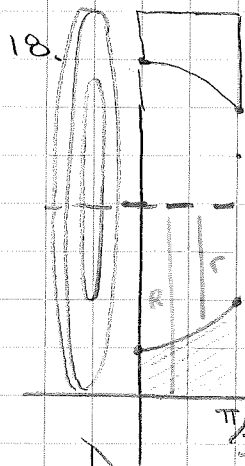
$$R = 6 - x^2$$

$$r = 6 - (4x - x^2) = x^2 - 4x + 6$$

$$A = \pi(6 - x^2)^2 - \pi(x^2 - 4x + 6)^2$$

$$V = \pi \int_0^2 (6 - x^2)^2 - (x^2 - 4x + 6)^2 dx = \boxed{\frac{64\pi}{3}}$$





$$y=0 \quad 0 \leq x \leq \pi/3$$

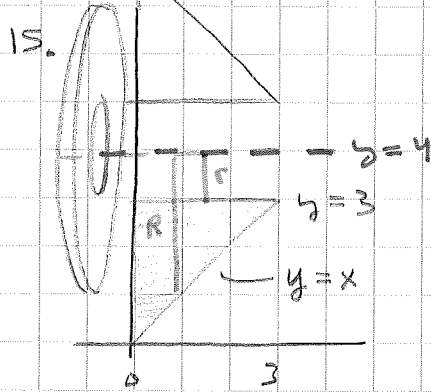
$$y = \sec x$$

$$R = 4 - 0 = 4$$

$$r = 4 - \sec x$$

$$A = \pi(4)^2 - \pi(4 - \sec x)^2$$

$$V = \pi \int_0^{\pi/3} 16 - (4 - \sec x)^2 dx \approx 27.657$$

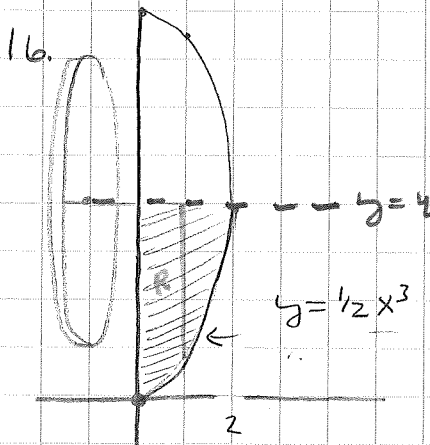


$$R = 4 - x$$

$$r = 4 - 3 = 1$$

$$A = \pi(4-x)^2 - \pi(1)^2$$

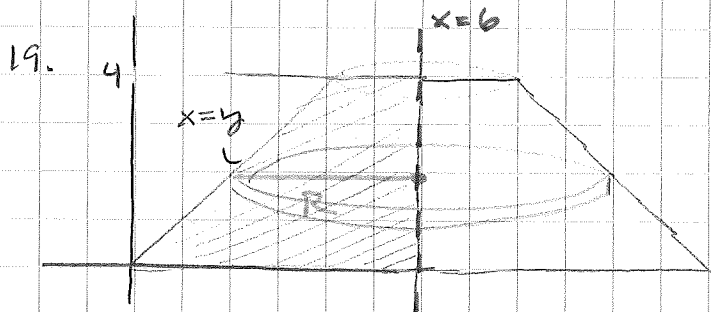
$$V = \pi \int_0^3 (4-x)^2 - 1 dx = \boxed{18\pi}$$



$$R = 4 - 1/2 x^3$$

$$A = \pi(4 - 1/2 x^3)^2$$

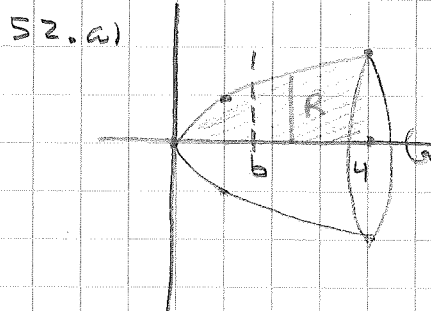
$$V = \pi \int_0^2 (4 - 1/2 x^3)^2 dx = \boxed{\frac{144\pi}{7}}$$



$$R = 6 - y$$

$$A = \pi(6-y)^2$$

$$V = \pi \int_0^4 (6-y)^2 dy = \boxed{\frac{208\pi}{3}}$$



$$R = \sqrt{x}$$

$$A = \pi(\sqrt{x})^2$$

$$A = \pi x$$

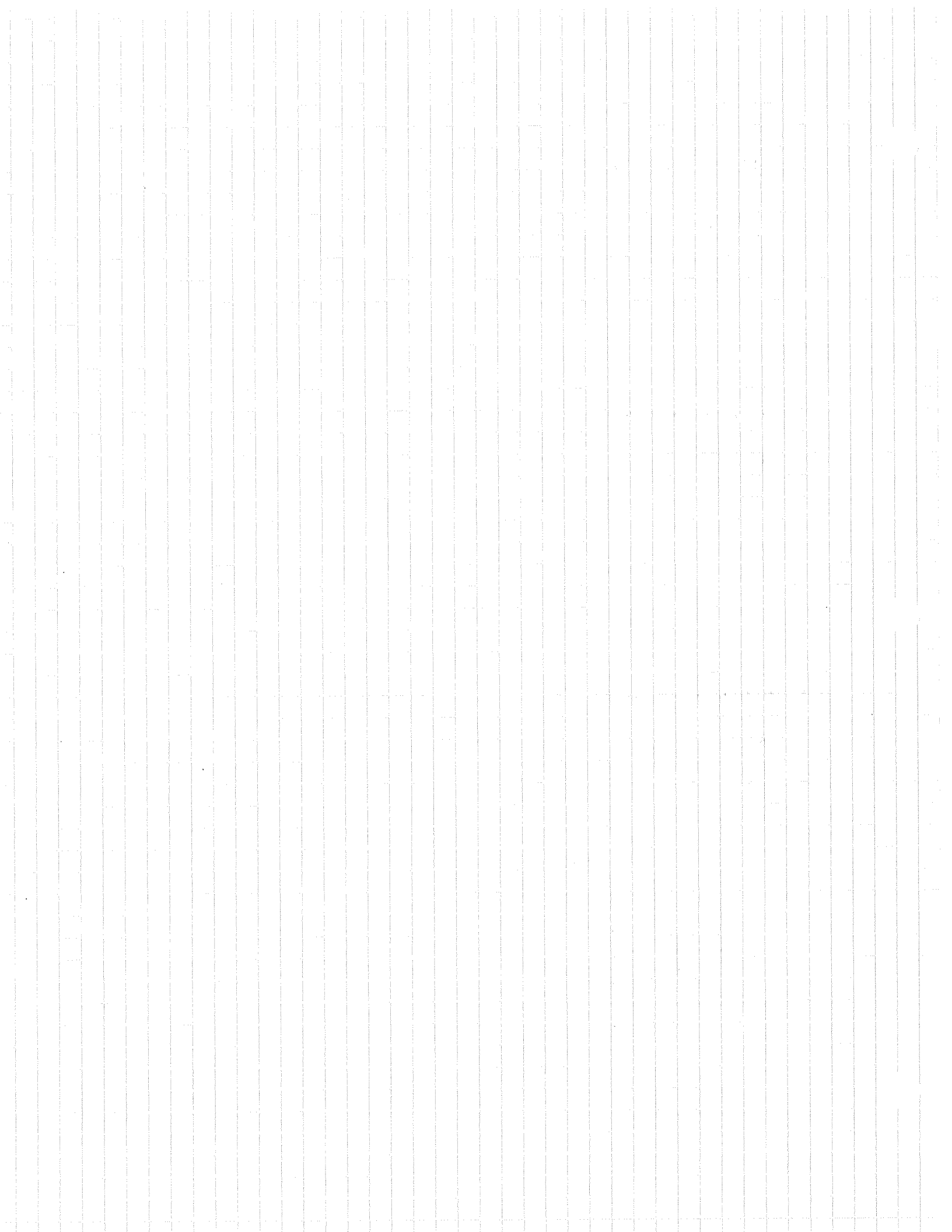
$$\pi \int_0^b x dx = \pi \int_0^4 x dx$$

$$[\frac{1}{2}x^2]_0^b = [\frac{1}{2}x^2]_0^4$$

$$\frac{1}{2}b^2 = \frac{1}{2}(4)^2 - \frac{1}{2}b^2$$

$$b^2 = 8$$

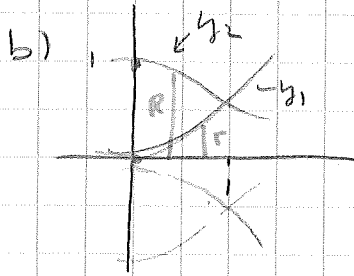
$$\boxed{b = 2\sqrt{2}}$$



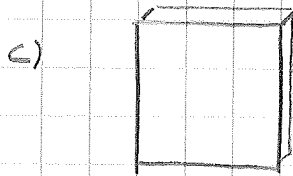
7-#4 Extra

a) $\int_0^a e^{-x^2} - (1 - \cos x) dx = 0.591$
 $\int_0^a y_2 - y_1 = 0.591$

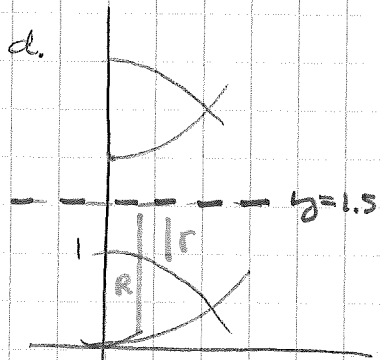
Point of Intersection:
 (a, b)
 $a \approx 0.9419, \dots$



$R = e^{-x^2}$
 $r = 1 - \cos x$
 $A = \pi (e^{-x^2})^2 - \pi (1 - \cos x)^2$
 $V = \pi \int_0^a (e^{-x^2})^2 - (1 - \cos x)^2 dx = 1.747$
 $\pi \int_0^a (y_2)^2 - (y_1)^2 = 1.747$



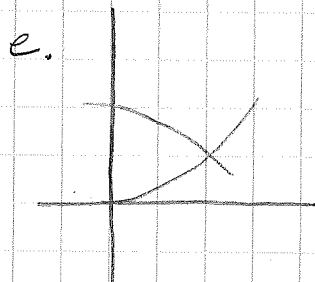
side = $e^{-x^2} - (1 - \cos x)$
 Area = $[e^{-x^2} - (1 - \cos x)]^2$
 $V = \int_0^a [e^{-x^2} - (1 - \cos x)]^2 dx = 0.461$
 $\int_0^a (y_2 - y_1)^2 dx = 0.461$



$R = 1.5 - (1 - \cos x) = 1.5 - y_1$
 $r = 1.5 - (e^{-x^2}) = 1.5 - y_2$
 $= \cos(x) - 0.5, \dots$

$A = \pi (1.5 - y_1)^2 - \pi (1.5 - y_2)^2$

$V = \pi \int_0^1 (1.5 - y_1)^2 - (1.5 - y_2)^2 dy = 3.823$



$\int_0^k y_2 - y_1 dx = \int_k^a y_2 - y_1 dx$

