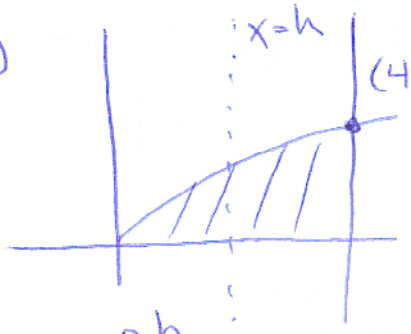
WS on Area & Volume

(1) a)



$$A = \int_0^4 \sqrt{x}\,dx$$

$$= \frac{2}{3}x^{3/2}\Big]_0^4 = \frac{16}{3} - 0 = \boxed{\frac{16}{3}}$$

b) $$\int_0^h \sqrt{x}\,dx = \frac{1}{2}\left(\frac{16}{3}\right)$$

$$\frac{2}{3}x^{3/2}\Big]_0^h = \frac{16}{6}$$

$$\frac{2}{3}h^{3/2} - 0 = \frac{16}{6}$$

$$h^{3/2} = \frac{16}{4} = 4$$

$$\boxed{h = 4^{2/3}}$$

c) disc

$R(x) = \sqrt{x}$

$$V = \pi\int_0^4 (\sqrt{x})^2\,dx = \pi\int_0^4 x\,dx$$

$$\pi\left(\frac{1}{2}x^2\Big]_0^4\right) = \boxed{8\pi}$$

d) ~~π~~ $$\int_0^k x\,dx = 4$$ ~~π~~

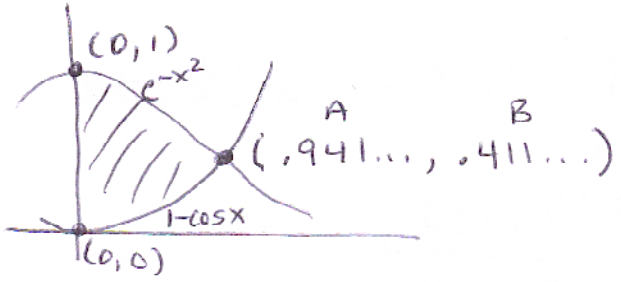
$$\frac{1}{2}x^2\Big|_0^k = 4$$

$$\frac{1}{2}k^2 = 4$$

$$k^2 = 8$$

$$\boxed{k = \sqrt{8}}$$

3



a) $\int_0^A e^{-x^2} - (1-\cos x)\,dx = \boxed{.591}$

b) washer

$R(x) = e^{-x^2}$

$r(x) = 1-\cos x$

$V = \pi \int_0^A \left((e^{-x^2})^2 - (1-\cos x)^2\right) dx$

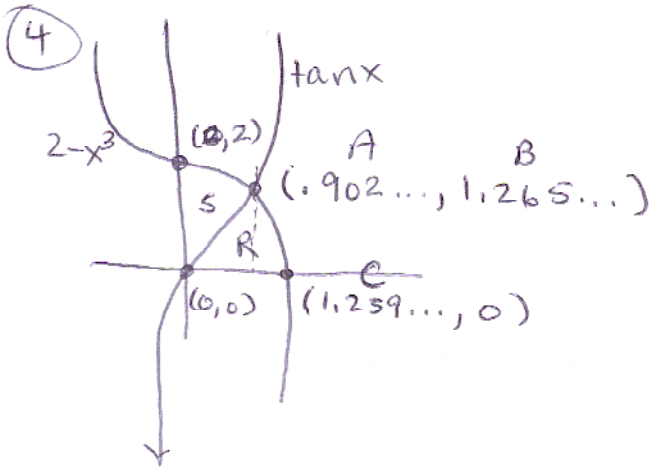
$= \boxed{1.747}$

c) $B_{c.s.} = e^{-x^2} - (1-\cos x)$

$A(x) = (e^{-x^2} - (1-\cos x))^2$

$V = \int_0^A (e^{-x^2} - (1-\cos x))^2\,dx = \boxed{.461}$

4



a) $A_R = \int_0^A \tan x\,dx + \int_A^C (2-x^3)\,dx$

$= \boxed{.729}$

b) $A_S = \int_0^A ((2-x^3) - \tan x)\,dx$

$= \boxed{1.161}$

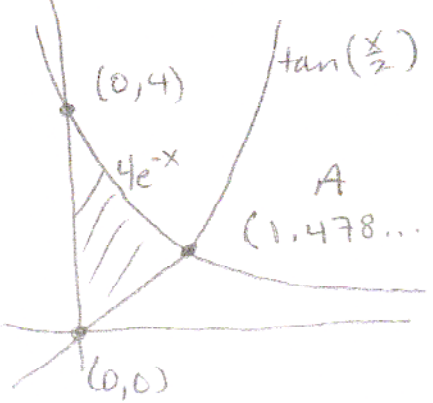
c) washer

$R(x) = 2-x^3$

$r(x) = \tan x$

$V = \pi \int_0^A (2-x^3)^2 - (\tan x)^2\,dx$

$= \boxed{8.332}$



a) $\int_0^A 4e^{-x} - \tan(\frac{x}{2})\,dx$

$= \boxed{2.483}$

b) washer

$R(x) = 4e^{-x}$

$r(x) = \tan(\frac{x}{2})$

$V = \pi \int_0^A (4e^{-x})^2 - (\tan(\frac{x}{2}))^2\,dx$

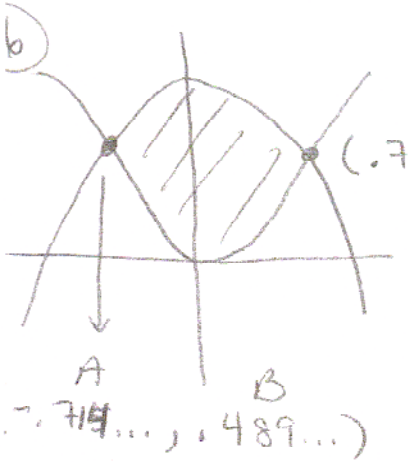
$= \boxed{22.743}$

c) $Bc.s. = 4e^{-x} - \tan(\frac{x}{2})$

$A(x) = \pi \left(\frac{4e^{-x} - \tan(\frac{x}{2})}{2}\right)^2$

$V = \int_0^A \pi \left(\frac{4e^{-x} - \tan(\frac{x}{2})}{2}\right)^2 dx = \boxed{4.747}$

b)



a) $A = \int_A^C (1-x^2) - \sin(x^2)\,dx$

$= \boxed{.947}$

b) washer

$R(x) = (1-x^2) - -1 = (1-x^2)+1 = 2-x^2$

$r(x) = \sin(x^2) + 1$

$V = \pi \int_A^C ((2-x^2)^2 - (\sin(x^2)+1)^2)\,dx$

$= \boxed{8.924}$

c) $Bcs = (1-x^2) - \sin(x^2)$

$A(x) = \frac{1}{2}((1-x^2)-\sin(x^2))^2$

$V = \int_A^C \frac{1}{2}((1-x^2)-\sin(x^2))^2$

$\boxed{.378}$