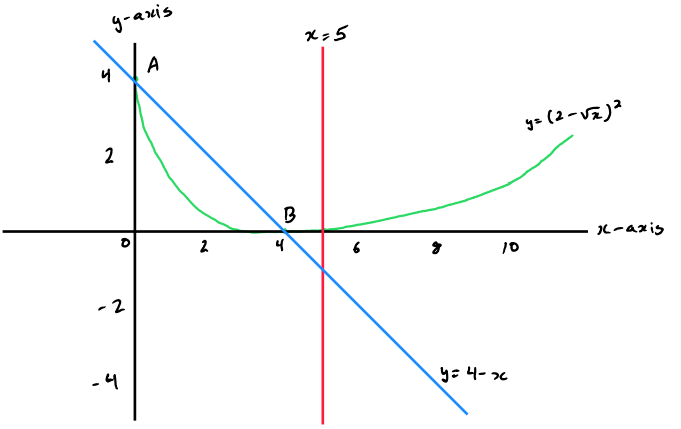
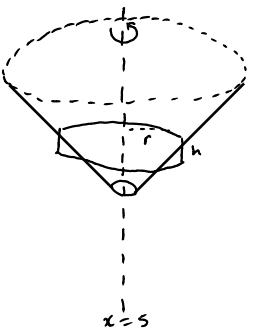
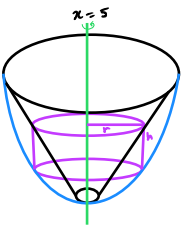
1a)





1b)



By the diagram:

r = horizontal distance between x (placed) and $x=5$

$= 5-x$

h = vertical distance between $y=4-x$ and $y=(2-\sqrt{x})^2$

$= (4-x)-(2-\sqrt{x})^2$

$$V = \int_0^4 2\pi \underbrace{(5-x)}_{r}\underbrace{\left((4-x)-(2-\sqrt{x})^2\right)}_{h} dx$$

$$= 2\pi \int_0^4 -10x + 20\sqrt{x} + 2x^2 - 4x^{3/2}\, dx$$

$$= 2\pi \left(-\int_0^4 10x\, dx + \int_0^4 20\sqrt{x}\, dx + \int_0^4 2x^2\, dx - \int_0^4 4x^{3/2}\, dx \right)$$

$$\rightarrow \int_0^4 10x\, dx = 80, \quad \int_0^4 20\sqrt{x}\, dx = \frac{320}{3}, \quad \int_0^4 2x^2\, dx = \frac{128}{3}, \quad \int_0^4 4x^{3/2}\, dx = \frac{256}{5}$$

$$\rightarrow 2\pi \left(-80 + \frac{320}{3} + \frac{128}{3} - \frac{256}{5} \right)$$

$$= 2\pi \left(\frac{272}{15} \right)$$

$$= \frac{544}{15}\pi \rightarrow \text{Final Answer}$$