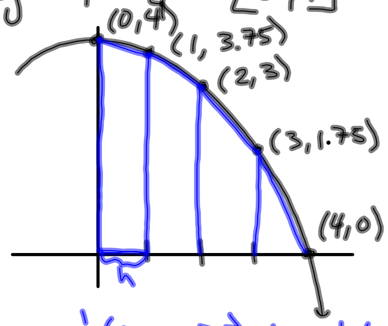
5.5

$y = 4 - \frac{x^2}{4}$ $[0,4]$



$$A_T = \tfrac{1}{2}(4+3.75)\cdot 1 + \tfrac{1}{2}(3.75+3)\cdot 1 + \tfrac{1}{2}(3+1.75)\cdot 1 + \tfrac{1}{2}(1.75+0)\cdot 1$$

$$= \tfrac{1}{2}(4+\underline{3.75+3.75}+\underline{3+3}+\underline{1.75+1.75}+0)$$

$$= \tfrac{1}{2}(4+2(3.75)+2(3)+2(1.75)+0)$$

$$= 10.5$$

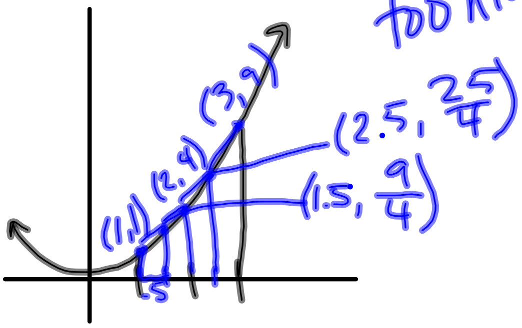
$$A_T = \frac{h}{2}(y_0 + 2y_1 + 2y_2 + \ldots + 2y_{n-1} + y_n)$$

Jan 30-11:55 AM

Use 4 subintervals

1. $\int_1^3 x^2\,dx$

too high (concave up)



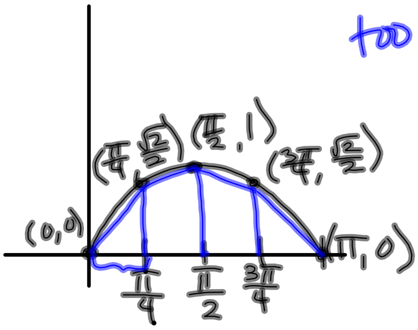
$$A_T = \frac{\frac{1}{2}}{2}\left(1 + 2\left(\tfrac{9}{4}\right) + 2(4) + 2\left(\tfrac{25}{4}\right) + 9\right)$$

$$= 8.75$$

Jan 30-1:20 PM

2. $\int_0^{\pi} \sin x \, dx$

too low (concave down)



$$A_T = \frac{\frac{\pi}{4}}{2}\left(0 + \cancel{2}\left(\frac{\sqrt{2}}{\cancel{2}}\right) + 2(1) + \cancel{2}\left(\frac{\sqrt{2}}{\cancel{2}}\right) + 0\right)$$

$$\frac{\frac{\pi}{4}}{2}\left(2\sqrt{2} + 2\right) = \frac{\frac{\pi}{4}}{\cancel{2}}\left(\cancel{2}(\sqrt{2}+1)\right)$$

$$= \frac{\pi}{4}\left(\sqrt{2}+1\right)$$

Jan 30-1:31 PM

3.

$$A_T = \frac{5}{2}\big(3 + 2(3.4) + 2(4) + 2(4.3) + 2(4.8) + 2(5.2) + 2(6.1) + 2(7.2) + 2(7.9) + 8\big)$$

$= 242$ ← just area

$V = 242 \cdot 40 = 9680 \text{ ft}^3$

Jan 30-1:36 PM

4. Convert 1 sec to $\frac{1}{3600}$ hr.

$$A_T = \frac{\frac{1}{3600}}{2}\left(0+2(3)+2(7)+2(12)+2(17)\right.$$
$$\left.+2(25)+2(33)+2(41)+48\right)$$

$$= .045 \text{ mi}$$

Jan 30-1:41 PM