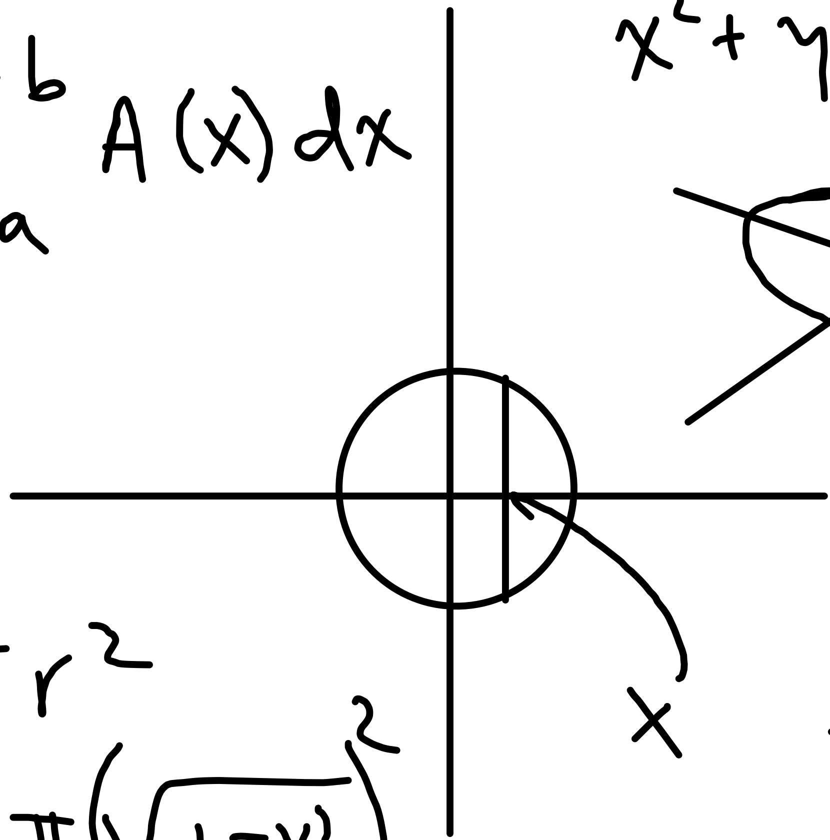
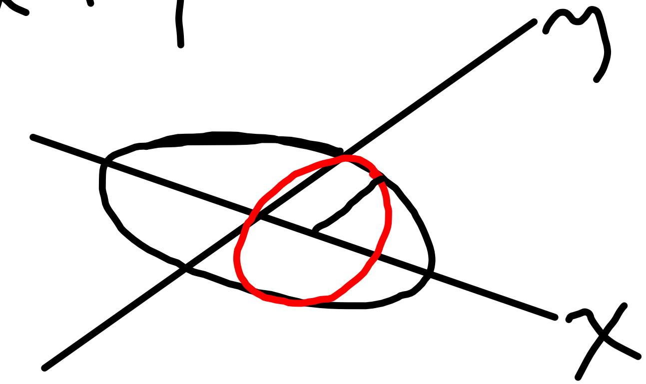
$$V = \int_a^b A(x)\,dx$$



$$x^2 + y^2 = 1$$



$$A = \pi r^2$$

$$r = y$$

but $y = \sqrt{1-x^2}$

$$A(x) = \pi\left(\sqrt{1-x^2}\right)^2$$

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

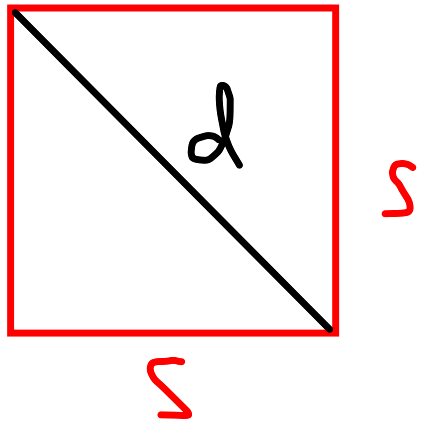
$s = \frac{d}{\sqrt{2}}$ ✓

$A(s) = s^2$

$d = s\sqrt{2}$

$A(d) = \left(\frac{d}{\sqrt{2}}\right)^2$

$= \frac{d^2}{2}$

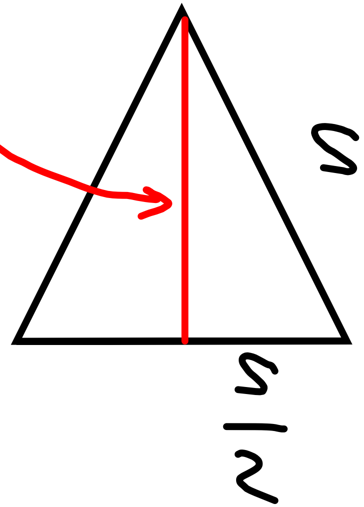


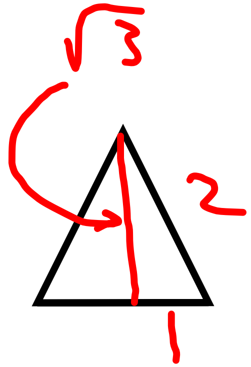
$\frac{1}{2} b h$

$$A = \frac{bh}{2}$$

$$A = \frac{s^2\sqrt{3}}{4}$$

$h = \frac{s}{2}\sqrt{3}$

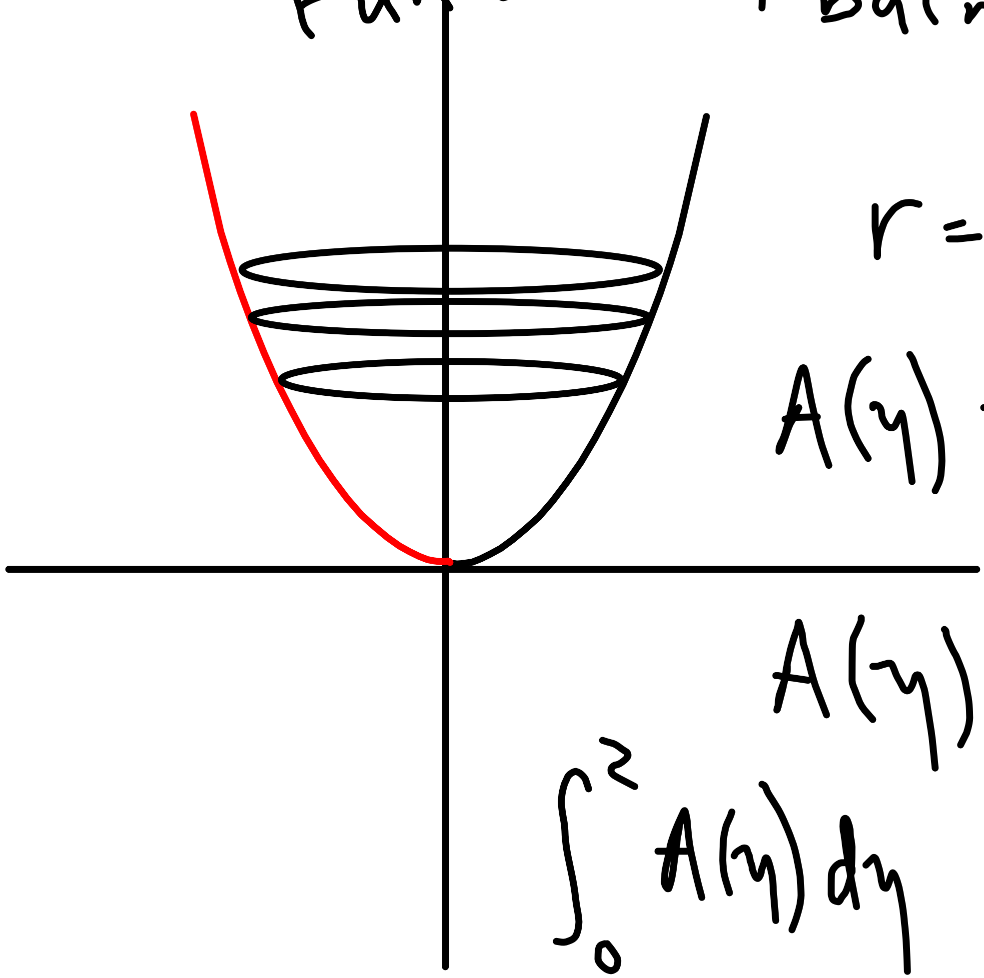




$x = \sqrt{y}$

x	y
0	0
1	1
2	4
3	9
4	16

Fun volume, but not #57



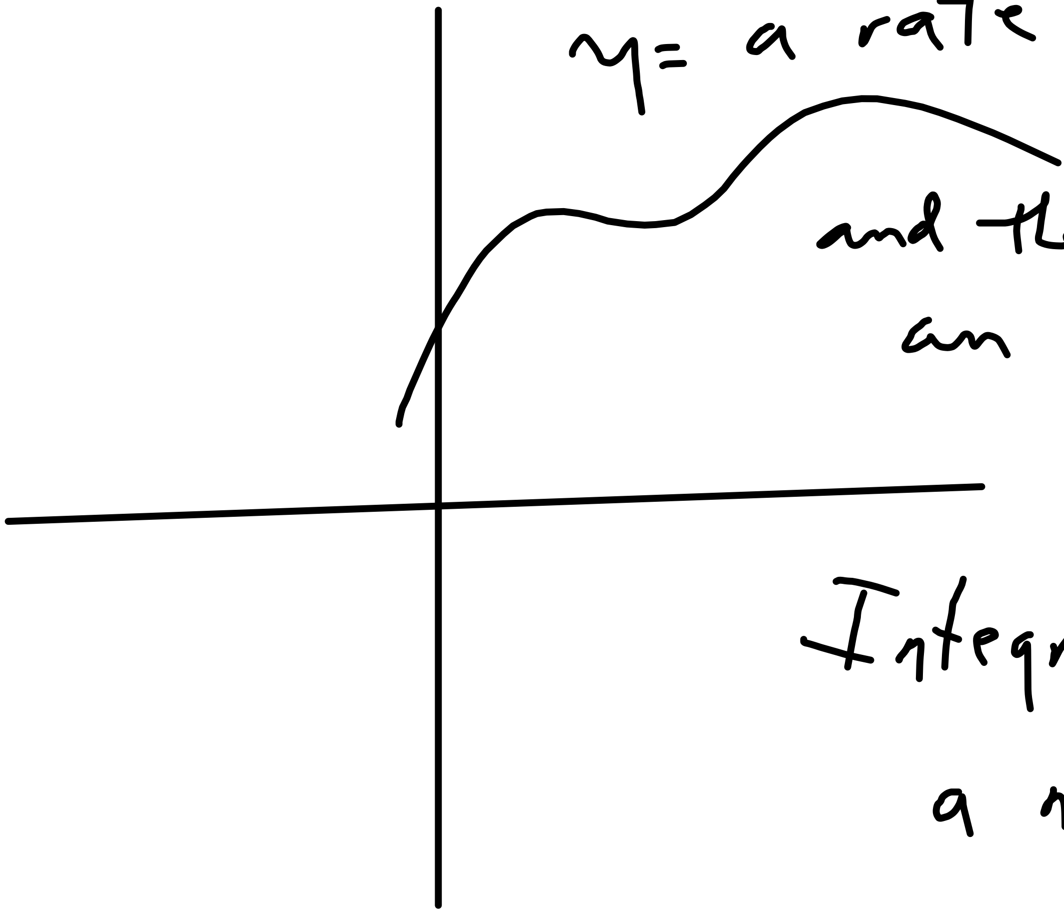
$r = \sqrt{y}$

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

$A(y) = \pi y$

$\int_0^2 A(y)\,dy$

$y=$ a rate function



and they ask for an amount

Integral as a net change

$y = r(x)$ Rate function

$$\int_a^b r(x)\,dx = \text{net change}$$

in the number of people in the park