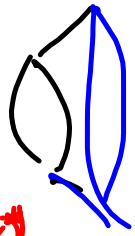
§8.2 #s 1,5,6, 13, 14, 21, 22, 25, 26

I was thinking

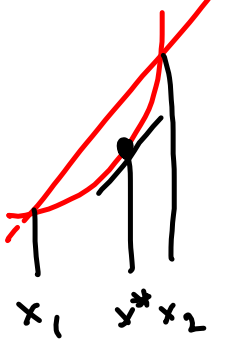
$2\pi \int f(x)\,dx$ But no.

Yes: $2\pi \int f(x) \sqrt{1+f'(x)^2}\,dx$



Mean Value Theorem

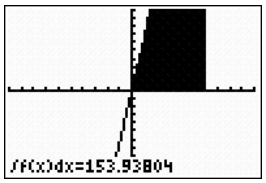
$\frac{\Delta y}{\Delta x} = f'(x^*)$



$\frac{f(x_2)-f(x_1)}{x_2-x_1} = f'(x^*)$

for some $x^* \in [x_1, x_2]$

$9x = y^2 + 18$ about x-axis, $2 \le x \le 6$



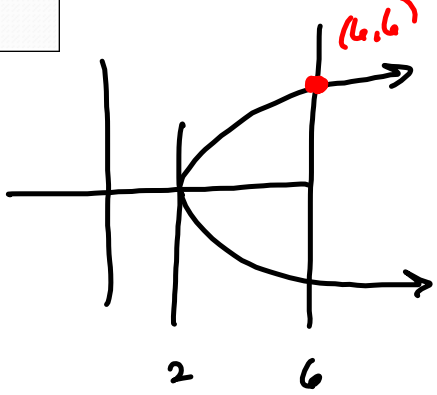
$x = \frac{1}{9}y^2 + 2$

$\frac{dx}{dy} = \frac{2}{9}y$

$2\pi \int y\, ds$

$= 2\pi \int_0^6 y\sqrt{1 + \frac{4}{81}y^2}\, dy$

Q: 2 #6



$y^2 + 18 = 9x$

$y^2 = 9x - 18$

$y = \pm\sqrt{9x-18} = \pm 3\sqrt{x-2}$

$y = 3\sqrt{x-2}$

$= 3(x-2)^{\frac{1}{2}}$

$y' = \frac{3}{2}(x-2)^{-\frac{1}{2}}$

$2\pi \int_2^6 3\sqrt{x-2}\sqrt{1 + \frac{9}{4}(x-2)^{-1}}\, dx$