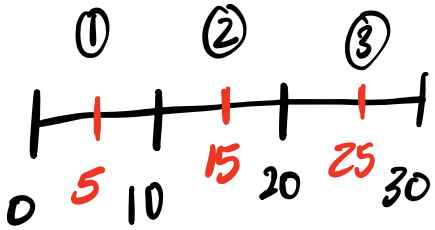
Homework 23:

3) $f(x) = x^2 + 2x$ $[0, 30]$ $n = 3$



$\Delta x = \frac{30 - 0}{3} = 10$

$f(5) = 35$

$f(15) = 255$

$f(25) = 675$

$10[35 + 225 + 675] = 9650$

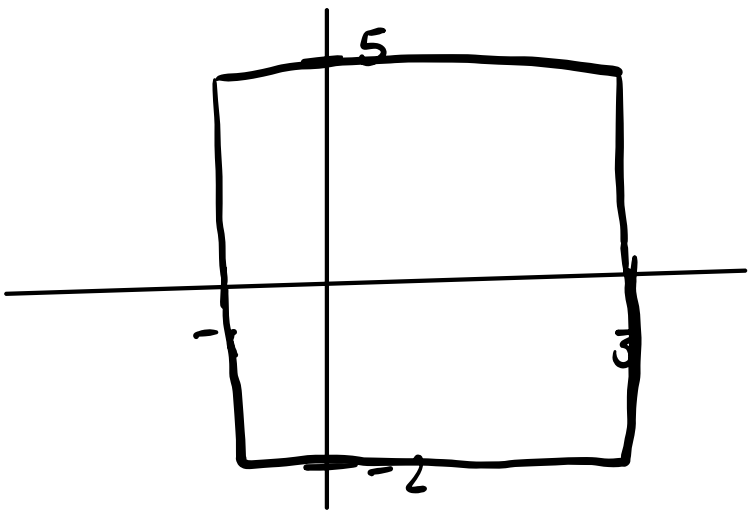
Homework 24:

6) $-2 \leq f(x) \leq 5$ $[-1, 3]$

$$\int_{-1}^{3} f(x)\,dx$$

upperbound: $\int_{-1}^{3} 5\,dx = 5x\Big|_{-1}^{3}$

$= 15 + 5 = 20$



lowerbound: $\int_{-1}^{3} -2\,dx$

$= -2x\Big|_{-1}^{3} = -6 - 2 = -8$

Homework 22:

6) $f(t) = \frac{t^2-1}{\sqrt{t}} = \frac{t^2}{t^{\frac{1}{2}}} - \frac{1}{t^{\frac{1}{2}}} = t^{\frac{3}{2}} - t^{-\frac{1}{2}}$

$F(t) = \frac{2}{5}t^{\frac{5}{2}} - 2t^{\frac{1}{2}} + C$

FTOC

$$\int_a^b f(x)\,dx = F(x)\Big|_a^b = F(b) - F(a)$$

$$\frac{d}{dx}\int_a^x f(t)\,dt = f(x)$$

$$\frac{d}{dx}\int_a^{2x} f(t)\,dt = 2f(2x)$$