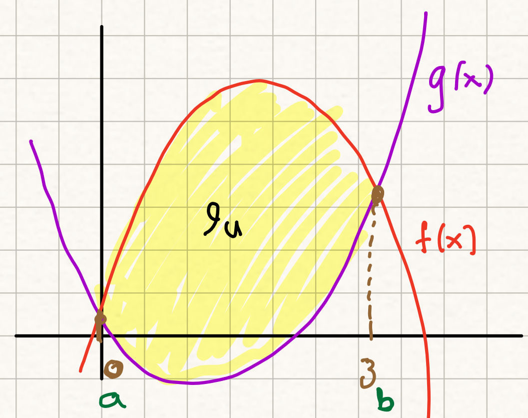
Área entre dos curvas.

$$A=\int_a^b [f(x)-g(x)]\,dx$$



$f(x)=-x^2+4x$; $g(x)=x^2-2x$

$$A=\int_0^3 (-x^2+4x)-(x^2-2x)\,dx$$

Manipular integrando.

$-x^2+4x-x^2+2x$

$-2x^2+6x$

$$A=\int_0^3 -2x^2+6x\,dx$$

$$\int f(x)+g(x)\,dx=\int f(x)\,dx+\int g(x)\,dx$$

$$=\int_0^3 -2x^2\,dx+\int_0^3 6x\,dx$$

$$\int k\,f(x)\,dx=k\int f(x)\,dx$$

$$=\underbrace{-2\int_0^3 x^2\,dx}_{A}+\underbrace{6\int_0^3 x\,dx}_{B}$$

$$\int x^n\,dx=\frac{x^{n+1}}{n+1}$$

A: $x=x$; $n=2$, $n+1=3$

B: $x=x$; $n=1$, $n+1=2$

$$=-2\left[\frac{x^3}{3}\right]\Bigg|_0^3+6\left[\frac{x^2}{2}\right]\Bigg|_0^3$$

$$=-\frac{2}{3}x^3+3x^2\Bigg|_0^3$$

Área.

$$A=\int_a^b f(x)\,dx=F(b)-F(a)$$

$$=-\frac{2}{3}x^3+3x^2\Bigg|_0^3$$

$$A=\left[-\frac{2}{3}(3)^3+3(3)^2\right]-\left[-\frac{2}{3}(0)^3+3(0)^2\right]$$

Jerarquía de operaciones.

P	R	M	D	S	R
Pot	Raíz	Mult	Divi	Sum	Rest

$\longrightarrow$ Izq a derecha

$$=\left[-\frac{2}{3}(27)+3(9)\right]-\cancel{\left[-\frac{2}{3}(0)+3(0)\right]}$$

$$=\left(-2(9)+27\right)-\cancel{(0+0)}$$

$$=(-18+27)-\cancel{(0)}$$

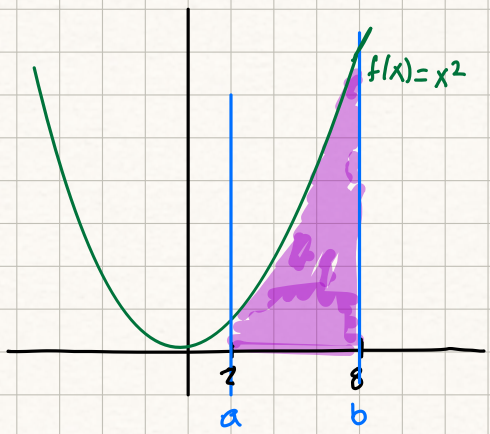
$$=(9)$$

$$=9$$

$$\therefore\ 9u^2$$

Hallar el área.

$y = x^2$ en $[2,8] \in \mathbb{R}$



$$A = \int_a^b f(x)\,dx = F(b) - F(a)$$

$$A = \int_2^8 x^2\,dx$$

$$\int x^n\,dx = \frac{x^{n+1}}{n+1}$$

$x = x$; $n = 2$; $n+1 = 3$

$$= \frac{x^3}{3}\Big|_2^8$$

$$= \left[\frac{(8)^3}{3}\right] - \left[\frac{(2)^3}{3}\right]$$

$$\begin{array}{r} {}^{3} \\ 64 \\ \times 8 \\ \hline 512 \end{array}$$

$$= \left(\frac{512}{3}\right) - \left(\frac{8}{3}\right)$$

$$= \frac{512}{3} - \frac{8}{3}$$

$$= \frac{504}{3}$$

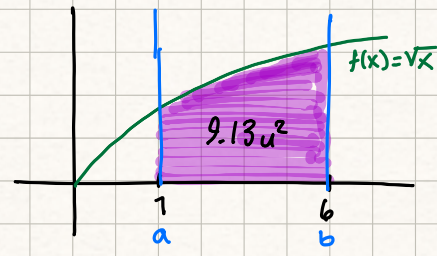
$$\begin{array}{r} 168 \\ 3\overline{)504} \\ -3 \\ \hline 20 \\ -18 \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

$$= 168$$

$\therefore 168\,u^2$

Hallar el área.

$y = \sqrt{x}$ en $[1,6] \in \mathbb{R}$



$$A = \int_a^b f(x)\,dx = F(b) - F(a)$$

$$A = \int_1^6 \sqrt[2]{x^1}\,dx$$

$$\sqrt[m]{a^n} = a^{\frac{n}{m}}$$

$$= \int_1^6 x^{\frac{1}{2}}\,dx$$

$$\int x^n\,dx = \frac{x^{n+1}}{n+1}$$

$x = x$; $n = \frac{1}{2}$; $n+1 = \frac{1}{2} + \frac{\cancel{1}^{\,2}}{\cancel{1}_{\,2}}$

$= \frac{1}{2} + \frac{2}{2}$

$= \frac{3}{2}$

$$= \frac{\frac{1}{1}x^{\frac{3}{2}}}{\frac{3}{2}}\Bigg|_1^6$$

$$= \frac{2}{3}x^{\frac{3}{2}}\Big|_1^6$$

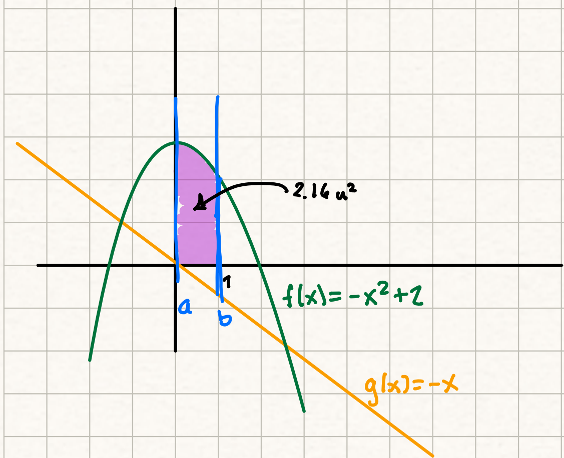
$$= \left[\frac{2}{3}(6)^{\frac{3}{2}}\right] - \left[\frac{2}{3}(1)^{\frac{3}{2}}\right]$$

$\approx 9.13\,u^2$

Hallar área entre curvas.

$f(x) = -x^2 + 2$ en $[0,1] \in \mathbb{R}$

$g(x) = -x$



$$A = \int_a^b [f(x) - g(x)]\, dx$$

$$A = \int_0^1 [(-x^2+2) - (-x)]\, dx$$

Manipular el integrando

$-x^2 + 2 + x$

$-x^2 + x + 2$

$$= \int_0^1 -x^2 + x + 2 \; dx$$

$$\int f(x) + g(x)\, dx = \int f(x)\, dx + \int g(x)\, dx$$

$$= \int_0^1 -x^2\, dx + \int_0^1 x\, dx + \int_0^1 2\, dx$$

$$\int k f(x)\, dx = k \int f(x)\, dx$$

$$= -1 \int_0^1 x^2\, dx + \int_0^1 x\, dx + 2 \int_0^1 dx$$

$$\int x^n\, dx = \frac{x^{n+1}}{n+1}$$

$$\int dx = x$$

$$= -1 \left[\frac{x^3}{3}\right]\Bigg|_0^1 + \left[\frac{x^2}{2}\right]\Bigg|_0^1 + 2[x]\Big|_0^1$$

$$= -1\left[\frac{x^3}{3}\right] + \left[\frac{x^2}{2}\right] + 2(x) \Bigg|_{0 \;\; a}^{1 \;\; b}$$

$A = F(b) - F(a)$

$$= -\frac{1}{3}x^3 + \frac{1}{2}x^2 + 2x \Bigg|_0^1$$

$$= \left[-\frac{1}{3}(1)^3 + \frac{1}{2}(1)^2 + 2(1)\right] - \cancel{\left[-\frac{1}{3}(0)^3 + \frac{1}{2}(0)^2 + 2(0)\right]}$$

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

$$= -\frac{1}{3} + \frac{1}{2} + 2$$

$$= \frac{13}{6}$$

$$\approx 2.16\, u^2$$

Hallar 'x':

$$\frac{x+10}{9} + \frac{x+7}{3} = 7$$

Hallar mcm de denominadores.

mcm (9,3) = 9

$$9\left[\frac{x+10}{9} + \frac{x+7}{3} = 7\right]$$

$$1(x+10) + 3(x+7) = 9(7)$$

$$1x + 10 + 3x + 21 = 63$$

$$4x + 31 = 63$$

$$4x = 63 - 31$$

$$4x = 32$$

$$x = \frac{32}{4}$$

$$x = 8$$