

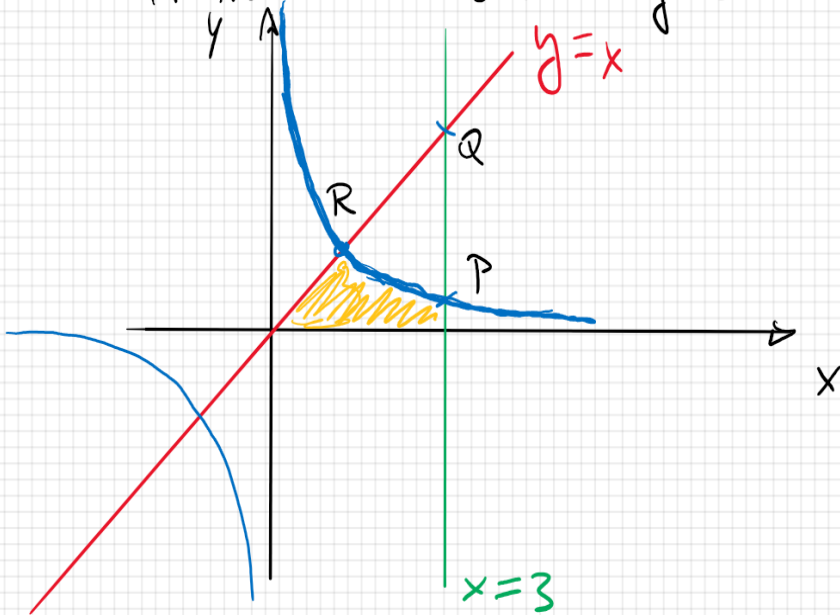
23 $f(x) = \frac{1}{x^3}$ Dom $f = \mathbb{R} - \{0\}$

Asíntota vertical $x=0$

Asíntota horizontal $y=0$

$$f'(x) = -\frac{3}{x^4} \Rightarrow \left\{ \begin{array}{l} \text{decreciente} \\ \text{convexa en } (0, +\infty) \\ \text{cóncava en } (-\infty, 0) \end{array} \right.$$

$$f''(x) = \frac{12}{x^5} \Rightarrow \left\{ \begin{array}{l} \text{convexa en } (0, +\infty) \\ \text{cóncava en } (-\infty, 0) \end{array} \right.$$



Intersecamos $y = \frac{1}{x^3}$ con $x=3 \Rightarrow P = (3, \frac{1}{27})$

Intersecamos $y=x$ con $x=3 \Rightarrow Q = (3, 3)$

Intersecamos $y = \frac{1}{x^3}$ con $y=x$:

$$\frac{1}{x^3} = x \Leftrightarrow x^4 = 1 \Leftrightarrow x = \pm 1 \Rightarrow \begin{array}{l} R = (1, 1) \\ S = (-1, -1) \end{array}$$

$$\text{Área} = \int_0^1 x \, dx + \int_1^3 \frac{1}{x^3} \, dx = \left[\frac{x^2}{2} \right]_0^1 + \left[\frac{-1}{2x^2} \right]_1^3 =$$

$$= \frac{1}{2} - \frac{1}{18} + \frac{1}{2} = \frac{17}{18} \text{ u}^2$$