TE aires et volumes

Intégrales

19/11/2025

35 1) à 4)

36 1) 2)

37 1) 3)

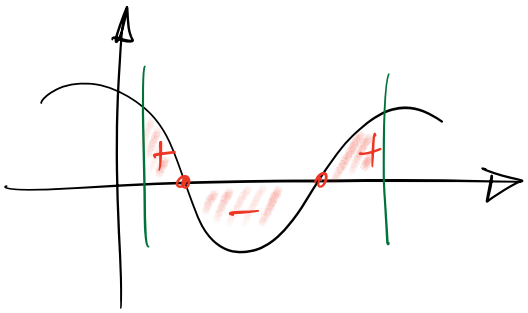
38 1) 2)

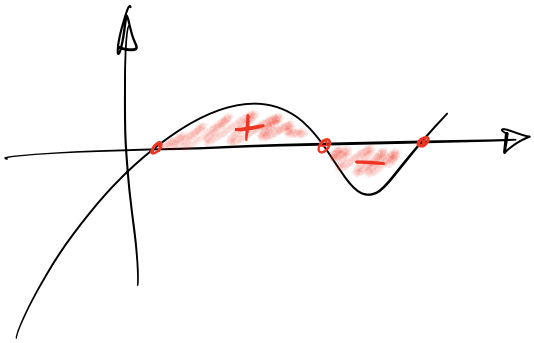
60 1) 2) 3)

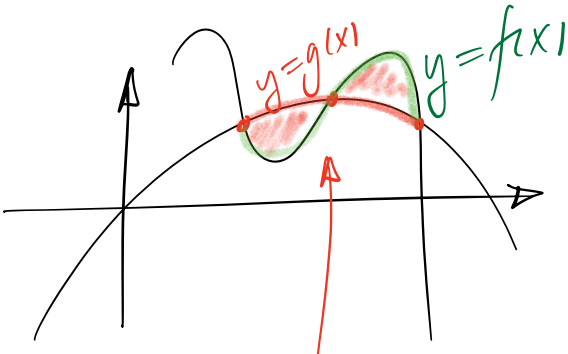
61

3.3.1 à 3.3.4

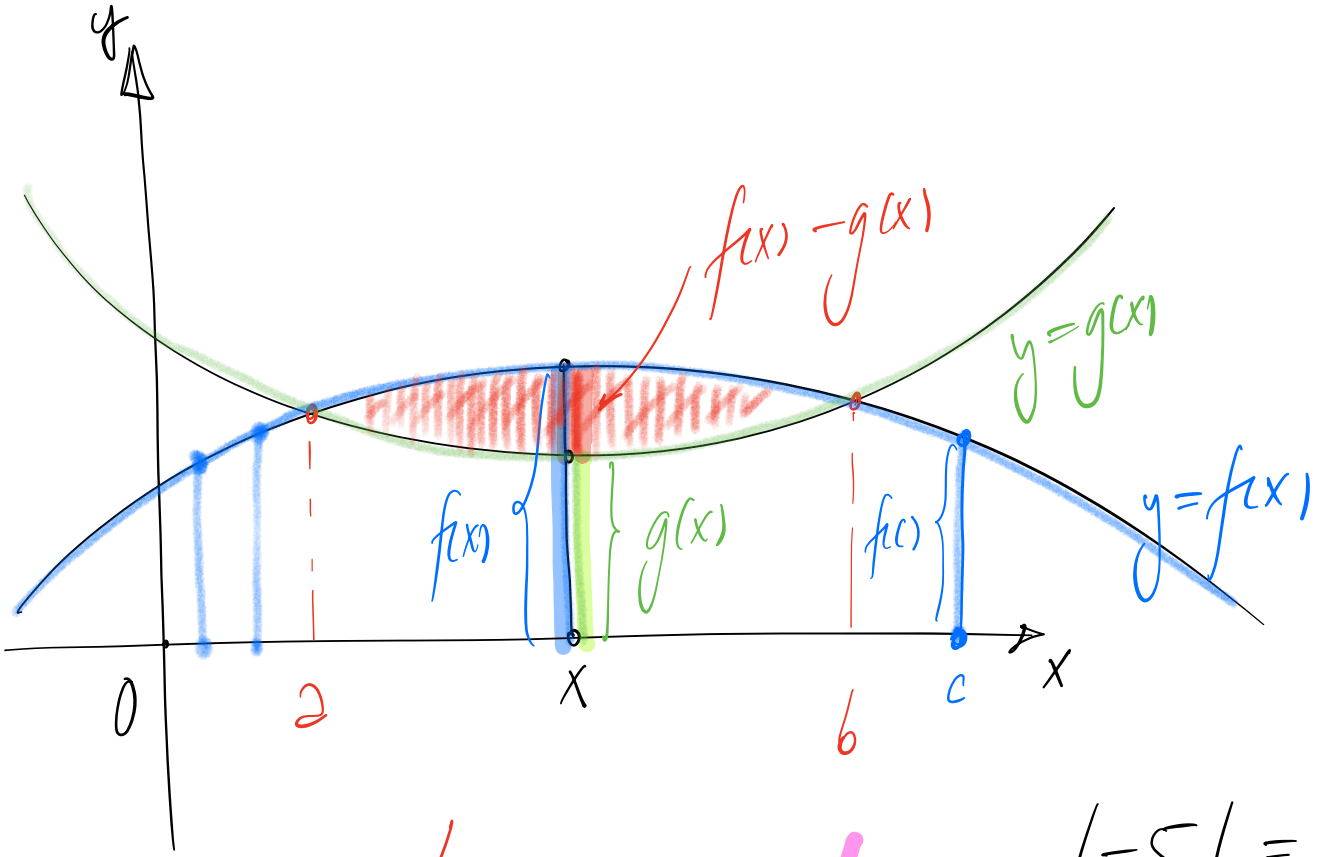
Cercle







A trouver : aire du domaine délimité par les graphes de f et g.



$$A = \left| \int_a^b (f(x) - g(x))\, dx \right|$$

$$|-5| = 5$$

$$|$$

$$f(x) \left| \begin{array}{l} | \; f(x) - g(x) \\ | \; g(x) \end{array} \right.$$

CKM 30 : 38 p. 177

Exemple:

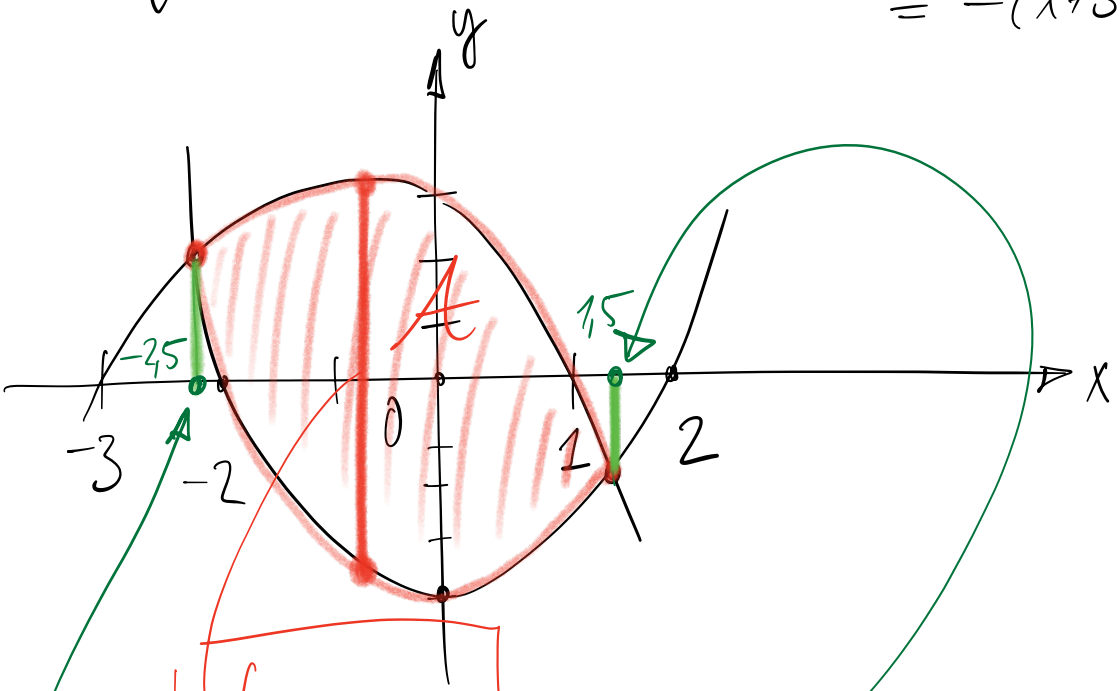
$$f(x) = x^2 - 4$$

$$g(x) = -x^2 - 2x + 3$$

} à dessiner

$$= -(x^2 + 2x - 3)$$

$$= -(x+3)(x-1)$$



$f(x) - g(x)$

Intersections: $f(x) - g(x) = 0 \Leftrightarrow f(x) = g(x)$

$$x^2 - 4 = -x^2 - 2x + 3$$

$$2x^2 + 2x - 7 = 0 \Leftrightarrow x = \frac{-2 \pm \sqrt{4 + 56}}{4}$$

$f(x) - g(x)$

$$\Leftrightarrow \quad x = \frac{-2 \pm \sqrt{60}}{4} \approx \begin{cases} \frac{-2+7{,}8}{4} \\ \frac{-2-7{,}8}{4} \end{cases}$$

$$x_1 \approx \begin{cases} 1{,}5 \\ -2{,}5 \end{cases}$$

$$A = \left| \int_{-2{,}5}^{1{,}5} (f(x) - g(x))\, dx \right|$$

$$= \left| \int_{-2{,}5}^{1{,}5} (2x^2 + 2x - 7)\, dx \right|$$

$$= \left| \left(\frac{2}{3}x^3 + x^2 - 7x \right) \Big|_{-2{,}5}^{1{,}5} \right|$$

$$= \left| \left(\frac{2}{3} \cdot 3{,}375 + 2{,}25 - 10{,}5 \right) - \left(\frac{2}{3}(-15{,}625) + 6{,}25 + 17{,}5 \right) \right|$$

$$\left| -6 \qquad -\left((-10{,}41\bar{6}) + 23{,}75 \right) \right|$$

$$= \left| -6 + 10,41\overline{6} - 23,75 \right| \approx \left| -19,33 \right|$$

$$\approx 19,33$$