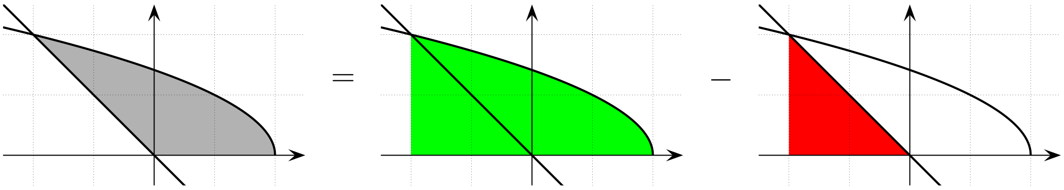
11.10



Déterminons les abscisses des points d'intersection des deux courbes :

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

$x^2 = 2 - x$

$0 = x^2 + x - 2 = (x+2)\,(x-1)$

L'égalité $-(-2) = \sqrt{2-(-2)}$ est vraie, mais l'égalité $-1 = \sqrt{2-1}$ non.

$$\int_{-2}^{2} \sqrt{2-x}\,dx - \int_{-2}^{0} -x\,dx = -\int_{-2}^{2} (2-x)^{\frac{1}{2}} \cdot (-1)\,dx + \int_{-2}^{0} x\,dx =$$

$$-\frac{1}{\frac{3}{2}}\,(2-x)^{\frac{3}{2}}\Big|_{-2}^{2} + \tfrac{1}{2}\,x^2\Big|_{-2}^{0} = -\tfrac{2}{3}\,(2-x)\,\sqrt{2-x}\,\Big|_{-2}^{2} + \tfrac{1}{2}\,x^2\Big|_{-2}^{0} =$$

$$-\Big(\big(\tfrac{2}{3}\cdot(2-2)\cdot\sqrt{2-2}\big) - \big(\tfrac{2}{3}\cdot(2-(-2))\cdot\sqrt{2-(-2)}\big)\Big) + \Big(\big(\tfrac{1}{2}\cdot 0^2\big) - \big(\tfrac{1}{2}\cdot(-2)^2\big)\Big) =$$

$$-\big(0 - \tfrac{16}{3}\big) + \big(0-2\big) = -(-\tfrac{16}{3}) + (-2) = \tfrac{10}{3}$$