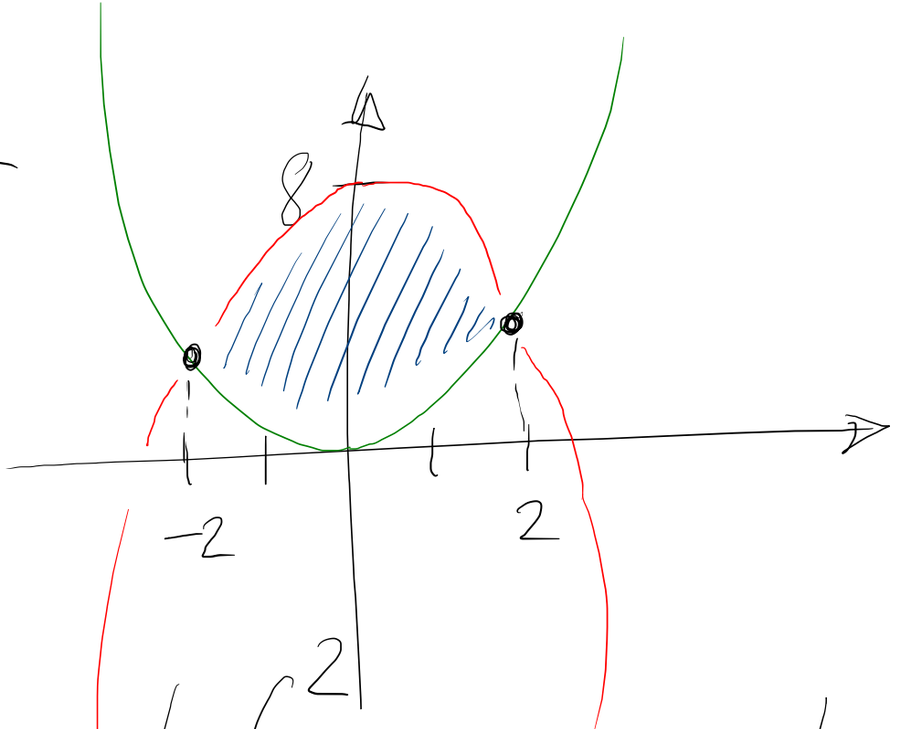
$f(x) = x^2$ $\quad g(x) = 8 - x^2 = (2\sqrt{2} - x)(2\sqrt{2} + x)$

$f(x) = g(x) \Leftrightarrow x^2 = 8 - x^2$

$\Leftrightarrow \quad 2x^2 = 8 \Leftrightarrow x^2 = 4$

$\Leftrightarrow \quad x = \pm 2$



$$A = \left| \int_{-2}^{2} (f(x) - g(x))\, dx \right| = \left| \int_{-2}^{2} (x^2 - (8 - x^2))\, dx \right|$$

$$\int_{-2}^{2} \left(x^2 - (8 - x^2)\right) dx = \int_{-2}^{2} \left(x^2 - 8 + x^2\right) dx$$

$$= \int_{-2}^{2} \left(2x^2 - 8\right) dx = \frac{2}{3}x^3 - 8x \Big|_{-2}^{2} = \frac{32}{3} - 32 = \frac{-64}{3}$$

$$= \left(\frac{2}{3} \cdot 8 - 16\right) - \left(\frac{2}{3} \cdot (-2)^3 - 8 \cdot (-2)\right) = \frac{16}{3} - 16 - \left(-\frac{16}{3} + 16\right)$$

$$\Rightarrow A = \left| \frac{-64}{3} \right| = \frac{64}{3}$$