

$$1) \sin(2x) = 0$$

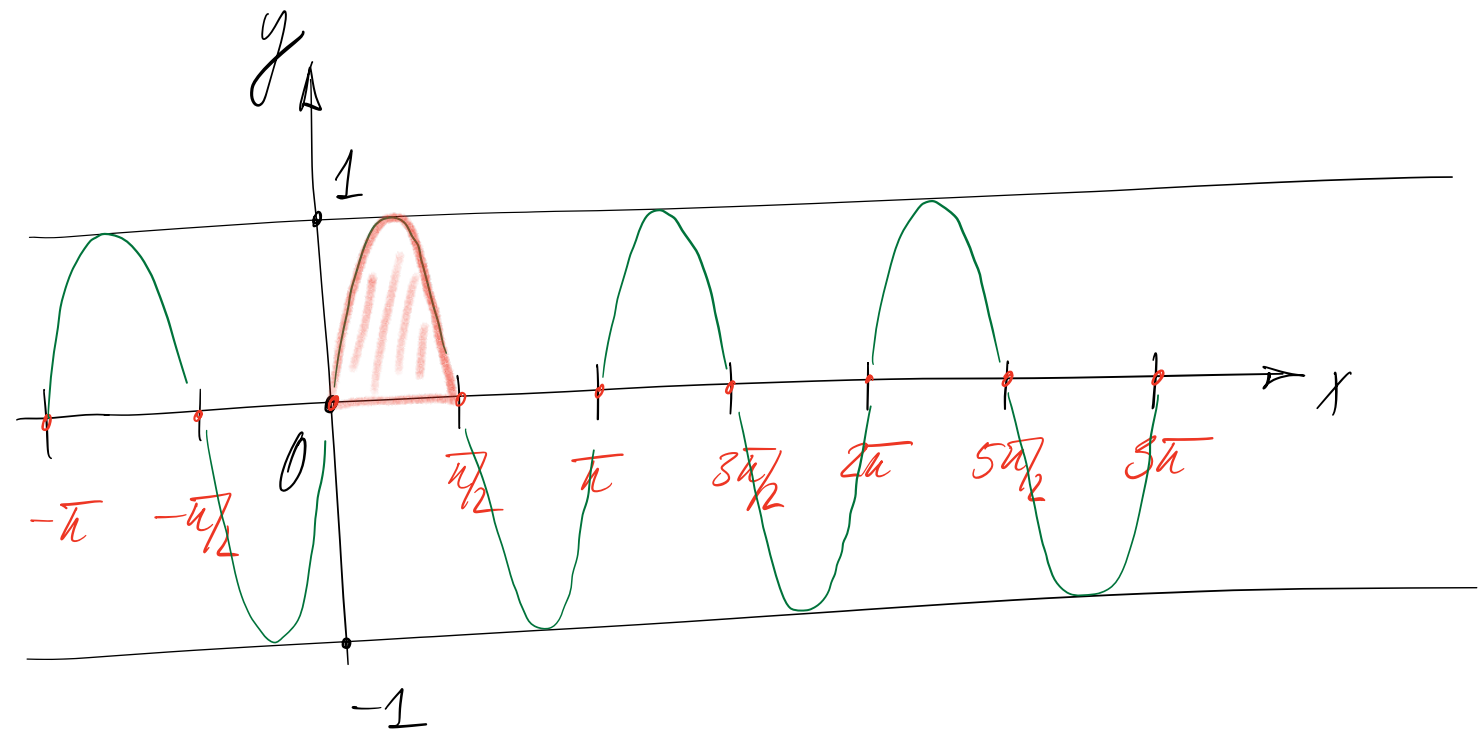
$$\arcsin(0) = 0$$

$$2x = \arcsin(0) + k \cdot 2\pi$$

$$2x = \pi - \arcsin(0) + k \cdot 2\pi$$

$$2x = k \cdot 2\pi \Leftrightarrow x = k \cdot \pi$$

$$2x = \pi + k \cdot 2\pi \Leftrightarrow x = \frac{\pi}{2} + k \cdot \pi$$



Il n'y a qu'une arc possible.

$$\left| \int_0^{\pi/2} \sin 2x \, dx \right| = \left| \frac{1}{2} \int_0^{\pi/2} \sin 2x \cdot (2x)' \cdot dx \right|$$

$$= \frac{1}{2} \cdot \left| (-\cos 2x) \right|_0^{\pi/2}$$

$$= \frac{1}{2} \left| (-\cos \pi) - (-\cos(0)) \right|$$

$$= \frac{1}{2} \left| 1 - (-1) \right| = \frac{1}{2} \cdot 2 = 1$$

La valeur de la seule aire possible est 1.

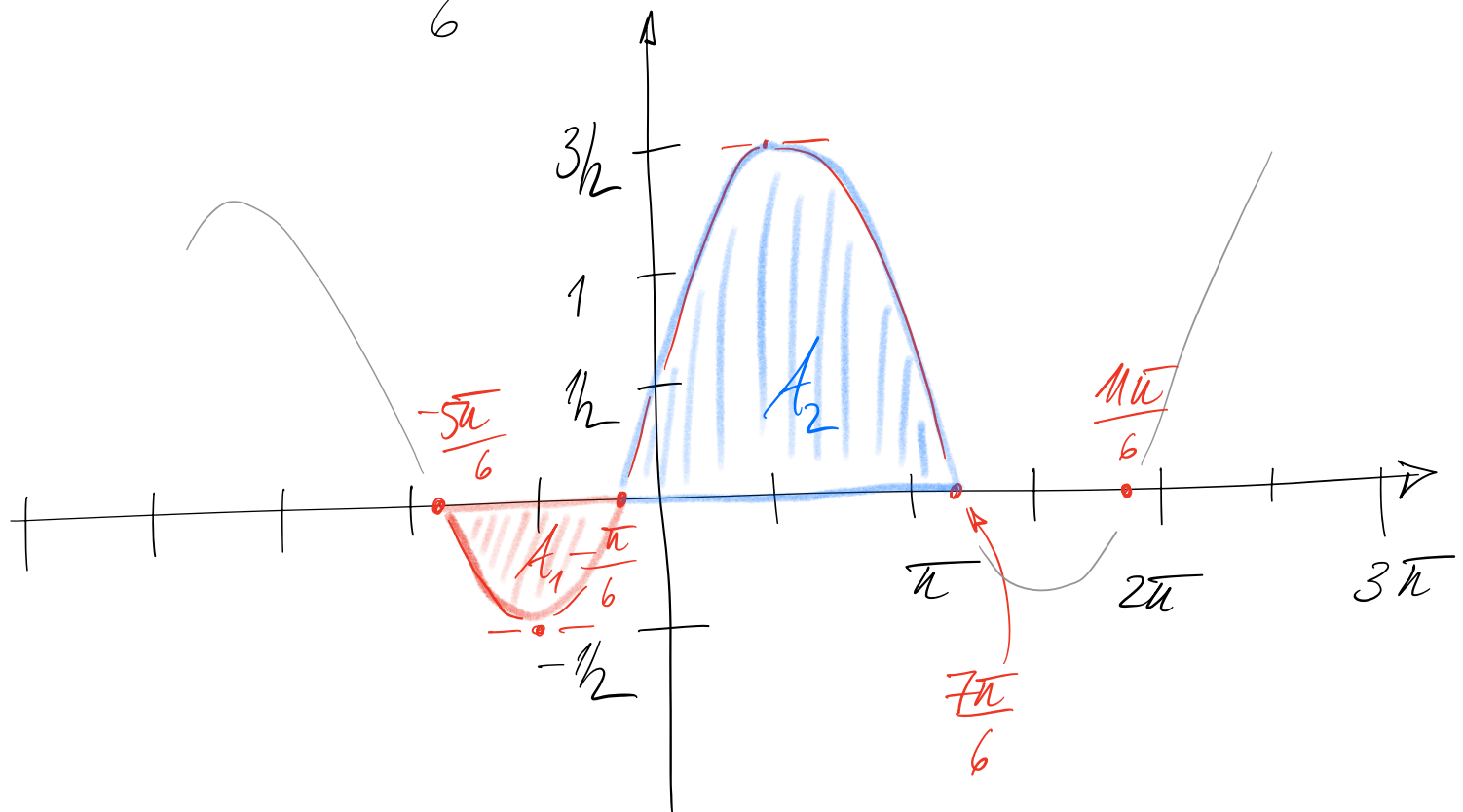
$$3) \quad \frac{1}{2} + \sin x = 0 \Leftrightarrow \sin x = -\frac{1}{2}$$

$$\Leftrightarrow x = \arcsin\left(-\frac{1}{2}\right) + k \cdot 2\pi$$

$$x = \pi - \arcsin\left(-\frac{1}{2}\right) + k \cdot 2\pi$$

$$\Leftrightarrow x = -\frac{\pi}{6} + k \cdot 2\pi$$

$$x = \frac{7\pi}{6} + k \cdot 2\pi$$



Il y a deux arcs possibles.

$$A_1 = \int_{-\frac{5\pi}{6}}^{-\frac{\pi}{6}} \left(\frac{1}{2} + \sin x \right) dx$$

$$= - \left(\frac{1}{2} x - \cos x \right) \Big|_{-\frac{5\pi}{6}}^{-\frac{\pi}{6}}$$

$$= - \left[\left(\frac{1}{2} \cdot \left(-\frac{\pi}{6} \right) - \overset{\frac{1}{2}\sqrt{3}}{\cos \left(-\frac{\pi}{6} \right)} \right) - \left(\frac{1}{2} \left(-\frac{5\pi}{6} \right) - \overset{-\frac{1}{2}\sqrt{3}}{\cos \left(-\frac{5\pi}{6} \right)} \right) \right]$$

$$= - \left(-\frac{\pi}{12} - \frac{1}{2}\sqrt{3} + \frac{5\pi}{12} - \frac{1}{2}\sqrt{3} \right)$$

$$= - \left(-\sqrt{3} + \frac{4\pi}{12} \right) = \sqrt{3} - \frac{\pi}{3}$$

$$A_2 = \int_{-\frac{\pi}{6}}^{\frac{7\pi}{6}} \left(\frac{1}{2} + \sin(x) \right) dx$$

$$= \left(\frac{1}{2}x - \cos x \right) \Big|_{-\frac{\pi}{6}}^{\frac{7\pi}{6}}$$

$$= \left(\frac{7\pi}{12} - \cos \frac{7\pi}{6} \right) - \left(\frac{1}{2} \cdot \left(-\frac{\pi}{6} \right) - \cos \left(-\frac{\pi}{6} \right) \right)$$

$$= \frac{7\pi}{12} - \left(-\frac{1}{2}\sqrt{3} \right) + \frac{\pi}{12} + \frac{1}{2}\sqrt{3}$$

$$= \sqrt{3} + \frac{2\pi}{3}$$