

ex 4:

$$1) \sin\left(\frac{x}{\pi} + 1\right) = 0 \Leftrightarrow \frac{x}{\pi} + 1 = k\pi$$

$$\Leftrightarrow x = \pi(k\pi - 1) \quad S \cap [0, 2\pi[ = \emptyset$$

$$2) \cos(x) = \frac{1}{4} \Leftrightarrow x = \pm \arccos\left(\frac{1}{4}\right) + 2k\pi \quad S \cap [0, 2\pi[ = \left\{ \arccos\left(\frac{1}{4}\right), 2\pi - \arccos\left(\frac{1}{4}\right) \right\}$$

$$3) \cos(5x) = \cos\left(x + \frac{\pi}{3}\right) \Leftrightarrow x = \frac{\pi}{12} + \frac{k\pi}{2} \text{ ou } x = -\frac{\pi}{18} + \frac{k\pi}{3}$$

$$S \cap [0, 2\pi[ = \left\{ \frac{\pi}{12}, \frac{7\pi}{12}, \frac{13\pi}{12}, \frac{19\pi}{12}, \frac{5\pi}{18}, \frac{11\pi}{18}, \frac{17\pi}{18}, \frac{23\pi}{18}, \frac{29\pi}{18}, \frac{35\pi}{18} \right\}$$

$$4) \sin(5x) = \cos(x) \Leftrightarrow x = \frac{\pi}{12} + \frac{k\pi}{3} \text{ ou } x = \frac{\pi}{8} + \frac{k\pi}{2}$$

$$S \cap [0, 2\pi[ = \left\{ \frac{\pi}{12}, \frac{5\pi}{12}, \frac{9\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}, \frac{21\pi}{12}, \frac{\pi}{8}, \frac{5\pi}{8}, \frac{9\pi}{8}, \frac{13\pi}{8} \right\}$$

$$5) \text{ tableau : } \tan(x) = 0 \text{ ou } \tan(x) = -5 \quad S = \{ k\pi, \arctan(-5) + k\pi, k \in \mathbb{Z} \}$$

$$6) \tan\left(x + \frac{\pi}{2}\right) = -\tan(x) \quad (*)$$

$$S \cap [0, 2\pi[ = \left\{ 0, \pi, \arctan(-5) + 2\pi, \arctan(-5) + \pi \right\}$$

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

$$\text{Pour } x \in \mathbb{R} \setminus \left\{ \frac{\pi}{2} + k\pi, k\pi, k \in \mathbb{Z} \right\}$$



$$(*) \Leftrightarrow \tan\left(x + \frac{\pi}{2}\right) = -\tan(-x) \Leftrightarrow x + \frac{\pi}{2} = -x + k\pi$$

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

$$\Leftrightarrow x = -\frac{\pi}{4} + \frac{k\pi}{2}$$

$$S \cap [0, 2\pi[ = \left\{ \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4} \right\}$$

ex 3:

$$6) \cos(2x) = -2\cos(x) - 1$$

$$\Leftrightarrow 2\cos^2(x) - 1 = -2\cos(x) - 1$$

$$\Leftrightarrow \cos(x) = 0 \text{ ou } \cos(x) = -1$$

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

$$S \cap [0, 2\pi[ = \left\{ \frac{\pi}{2}, \pi, \frac{3\pi}{2} \right\}$$

