Method #2 Direct computation

Text Example 3.5

$$x(t)=\begin{cases}1 & \text{if } |t|<T_1 \\ 0 & \text{if } T_1<|t|<\frac{T}{2} \\ \text{periodic with period } T\end{cases}$$

Q_1: Plot $x(t)$

Q_2: Find its FS representation.

A_1:

A_2:

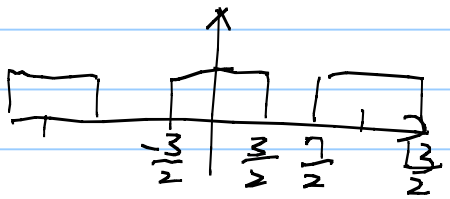
Note Title 2/12/2010

Q: why a_0 needs to be considered separately?

Synthesis

$x(t) =$

Example $T = 5$, $T_1 = \frac{3}{2}$,



Q: Find its FS representation.

Ans:

$$x(t) = a_0 + a_1 e^{j\frac{2\pi}{5}t} + a_2 e^{j2\times\frac{2\pi}{5}t} + a_{-1} e^{-j\frac{2\pi}{5}t} + a_{-2} e^{j(-2)\cdot\frac{2\pi}{5}t} + \cdots$$

$$= a_0 + a_1\left(2\cos\left(\frac{2\pi}{5}t\right)\right) + a_2\times\left(2\cos\left(\frac{2\times 2\pi}{5}t\right)\right)$$

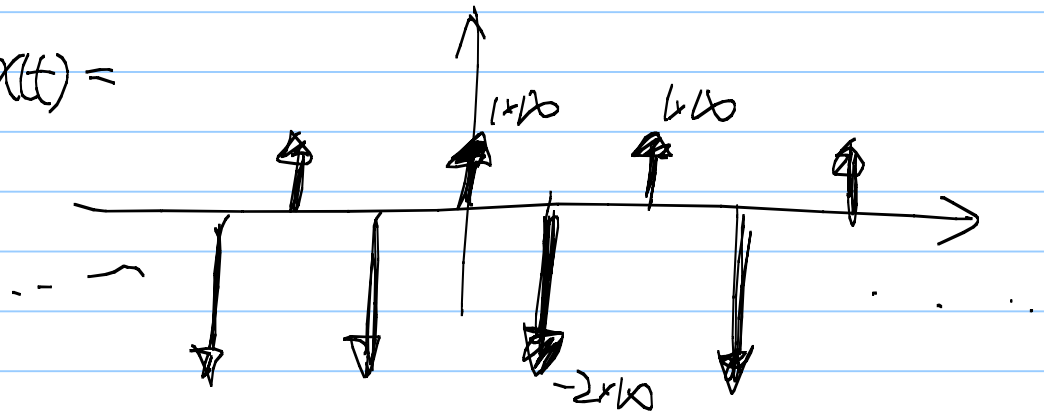
$$+ \cdots$$

The summation of many cosine signals

* See the additional handout.

HW6Q56 Prob 3.22(a) — fig(d)

$x(t) =$



Q: $x(t)$ is continuous-time or discrete-time ?

A =

Q Find its FS representation.

Ans: