KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI
MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY
INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FAKULTAS TEKNOLOGI INDUSTRI DAN REKAYASA SISTEM
FACULTY OF INDUSTRIAL TECHNOLOGY AND SYSTEMS ENGINEERING
DEPARTEMEN TEKNIK FISIKA / *DEPARTMENT OF ENGINEERING PHYSICS*
Gedung C dan E/Building E and C, Kampus ITS Sukolilo, Surabaya 60111
Telp/Phone: (031) 5947188, Fax : 031-5923626
Website : its.ac.id/tfisika/ Email : tfisika@its.ac.id

Terakreditasi oleh/ *Accredited by*: BAN-PT, IABEE

Tersertifikasi oleh/ *Certified by*: ASEAN University Network, AUN-QA

QUIZ/ETS/EAS | SEMESTER GASAL/GENAP | TAHUN ..... / .....

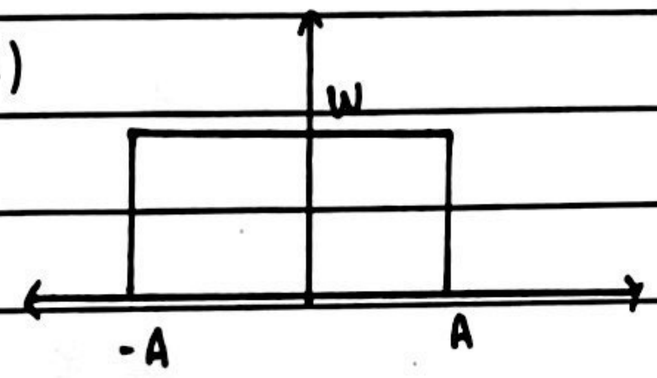
MATA KULIAH : SPO KODE : .....

HARI, TANGGAL : ..... KELAS : .....

DOSEN : ..... RUANG : .....

NAMA : Muhammad Rifan .I.A	TANDA TANGAN	NILAI
NRP : 5009211138		
DOSEN WALI :		

2.a)



$$f(t) = \begin{cases} W ; A \le t \le A \\ 0 ; \text{otherwise} \end{cases}$$

$$\mathcal{F}\{f(t)\} = \int_{-\infty}^{\infty} f(t) \cdot e^{-j2\pi ft}\, dt$$

$$= \int_{-A}^{A} W \cdot e^{-j2\pi ft}\, dt$$

$$= \frac{W}{-j2\pi f}\left[e^{-j2\pi ft} \right]_{-A}^{A}$$

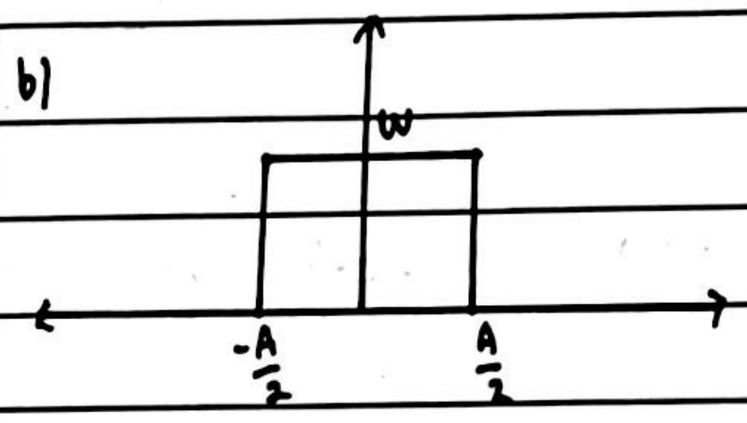
$$= \frac{W}{-j2\pi f}\left[e^{-j2\pi fA} \cdot e^{-j2\pi fA} \right]$$

$$= \frac{W}{\pi f}\left[\frac{e^{+j2\pi fA} - e^{-j2\pi fA}}{j2} \right]$$

$$F(f) = 2A \cdot W \cdot \frac{\sin(2\pi fA)}{2\pi fA}$$

$$F(f) = 2 \cdot A \cdot W \cdot \operatorname{sinc}(2f \cdot A)$$

b)



$$f(t) = \begin{cases} W ; -\frac{A}{2} \le t \le \frac{A}{2} \\ 0 ; \text{otherwise} \end{cases}$$

$$\mathcal{F}\{f(t)\} = \int_{-\infty}^{\infty} f(t) \cdot e^{-j2\pi ft}\, dt$$

$$= \int_{-\frac{A}{2}}^{\frac{A}{2}} W \cdot e^{-j2\pi ft}\, dt$$

$$= \frac{W}{-j2\pi f}\left[e^{-j2\pi ft} \right]_{-\frac{A}{2}}^{\frac{A}{2}}$$

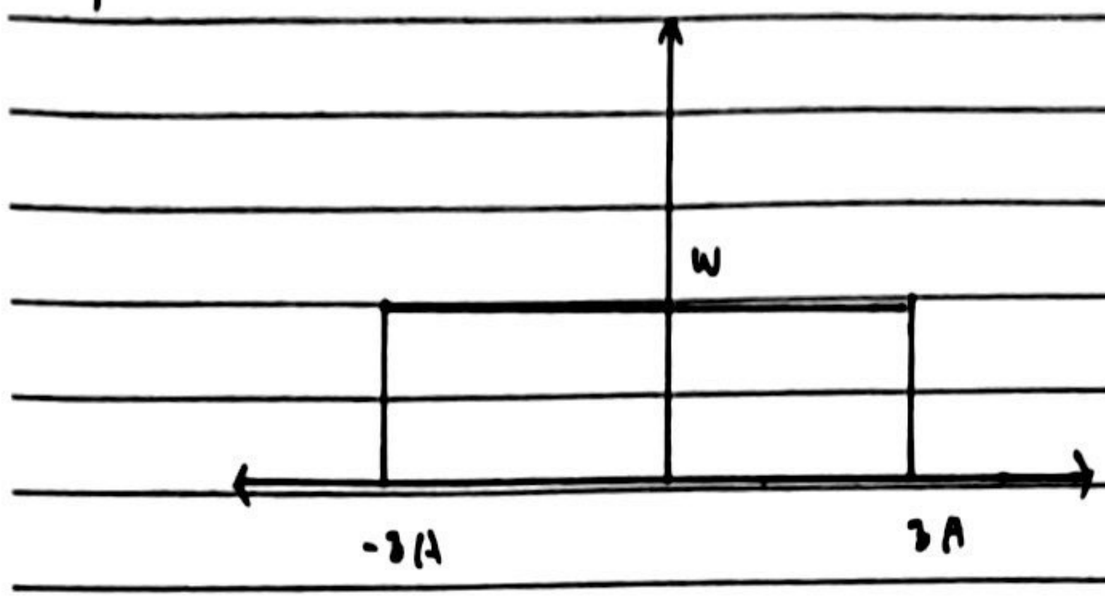
$$= \frac{W}{-j2\pi f}\left[e^{-j\pi fA} - e^{j2\pi f\frac{A}{2}} \right]$$

$$= \frac{W}{j2\pi f}\left[e^{j\pi fA} - e^{-j\pi fA} \right]$$

$$F(f) = AW \cdot \frac{\sin(\pi fA)}{\pi fA}$$

$$F(f) = A.W \cdot \operatorname{sinc}(fA)$$

c)



$$f(t) \begin{cases} W ; -3A \le t \le 3A \\ 0 ; \text{otherwise} \end{cases}$$

$$F\{f(t)\} = \int_{-\infty}^{\infty} f(t) \cdot e^{-j2\pi ft}\, dt$$

$$= \int_{-3A}^{3A} W \cdot e^{-j2\pi ft}\, dt$$

$$= \frac{W}{-j2\pi f} \cdot \left[e^{-j2\pi ft} \right]_{-3A}^{3A}$$

$$= \frac{W}{-j2\pi f} \cdot \left[e^{-j2\pi f 3A} - e^{j2\pi f 3A} \right]$$

$$= \frac{W}{\pi f} \cdot \sin(6\pi fA)$$

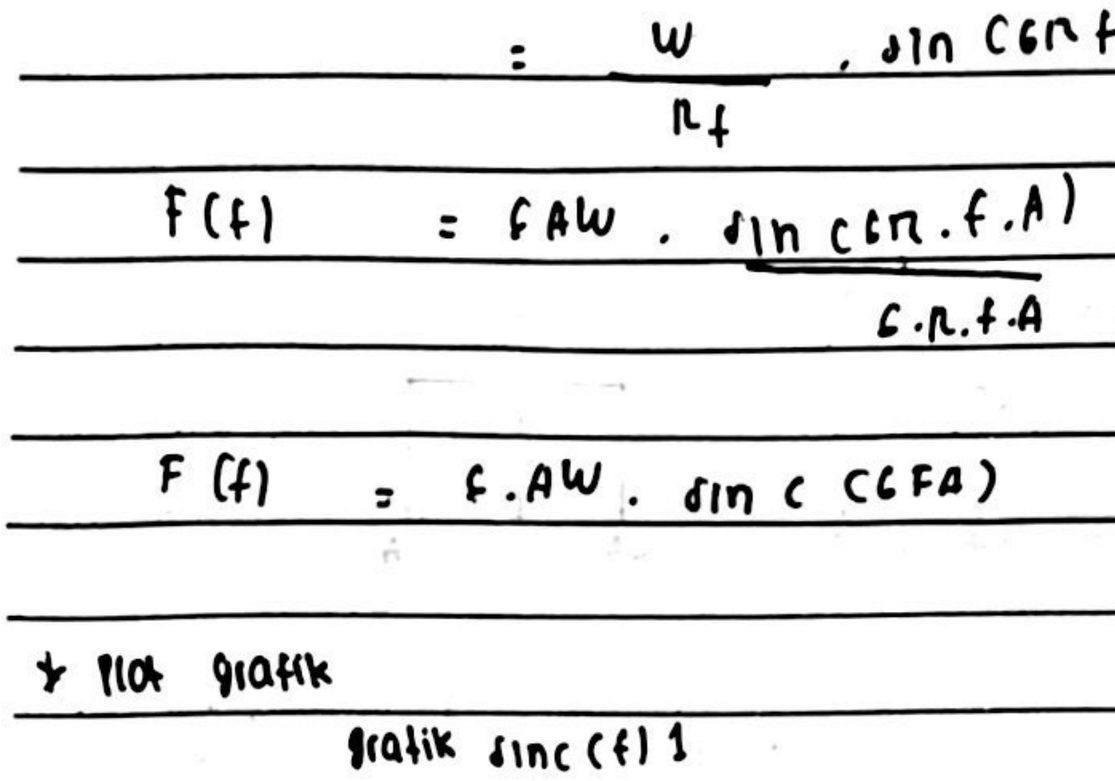
$$F(f) = 6AW \cdot \frac{\sin(6\pi \cdot f \cdot A)}{6 \cdot \pi \cdot f \cdot A}$$

$$F(f) = 6 \cdot AW \cdot \text{sinc}(6fA)$$

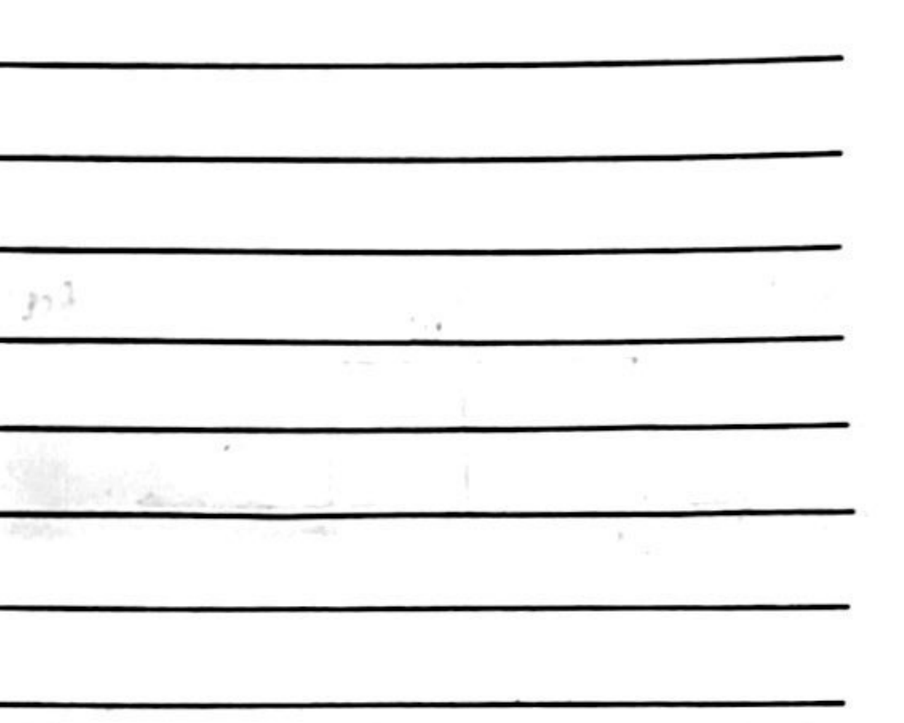
* Plot grafik

gratik sinc(f) 1

a)



b)



c)