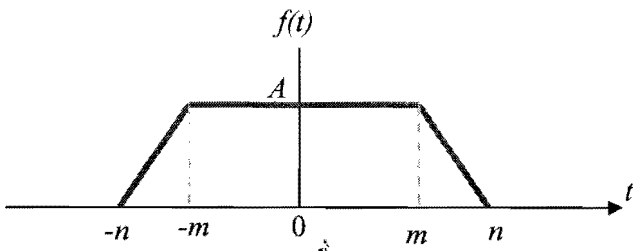
King Fahd University of Petroleum & Minerals
Electrical Engineering Department
EE370: Communications Engineering I (101)
Quiz 2: Fourier Transform (Dr. Muqaibel)

Serial # 0

-1 points for not writing your serial #

Name: KEY Sec. 2

Using the time differentiation property, determine the Fourier Transform of the trapezoidal function $f(t)$ shown in the figure.
Tables provided at the back of this page. *Your final answer should be written in the simplest format. Show your steps.*



$$f''(t) = \frac{A}{n-m}\left[\delta(t+n) + \delta(t+m)\right]$$

(2) $$- \frac{A}{n-m}\left[\delta(t-n) + \delta(t-m)\right]$$

$$(jw)^2 F(w) = \frac{A}{n-m}\left[e^{jwm} + e^{-jwm}\right]$$

$$- \frac{A}{n-m}\left[e^{jwn} + e^{-jwn}\right]$$

(2) ⇒ $$F(w) = \frac{2A}{(n-m)}\left(\frac{\cos mw - \cos nw}{w^2}\right)$$ (2)

Using differentiation property

$$\frac{d^n g}{dt^n} \Leftrightarrow (jw)^n G(w)$$