Homework - IV

1. Show the modulation property of the Fourier transform.
2. Show that if a two dimensional sequence is separable then so is its Fourier transform, i.e., if $A(m,n) = A_1(m)A_2(n)$ then $F_A(w_1,w_2) = F_{A_1}(w_1)F_{A_2}(w_2)$ where $F_{A_1}(w_1), F_{A_2}(w_2)$ are *one* dimensional Fourier transforms such as $F_a(w) = \frac{1}{2\pi}\sum_{n=-\infty}^{+\infty} a(n)e^{-jwn}$.
3. Obtain the Fourier transform of the 2-D sequence $A(m,n)$ given by:

	$n=0$	1	2
$m=0$	1	2	-1
1	2	4	-2
2	-1	-2	1

   Simplify your answer as much as possible.
4. Calculate the Fourier transform of the limited extent sequence $A(m,n) = 1,\ 0 \le m < 8, 0 \le n < 8$ and $A(m,n) = 0$ otherwise.
5. Calculate the Fourier transform of the limited extent sequence $A(m,n) = (-1)^{m+n},\ 0 \le m < 8, 0 \le n < 8$ and $A(m,n) = 0$ otherwise.