That is, if f is measurable then

$$f'(B) \in \mathcal{M}$$
 for all Dovelsets B.

If N is null and f: N => TR then f is measurable.
If f: D => R is mousurable and if 0: D => R and

$$g = f$$
 except on a null set then g is measurable
" $g = f$ almost everywhere"
a.e. p.p. (except on a null set) $f^{-1}((u, \omega))$
 $g^{-1}((u, \omega)) = (f^{-1}((u, \omega)) \setminus (\xi f > u - 3) (\xi g > u))$
meas
 $V[\xi g > u] N \xi f \leq u - 3)$

mensuable

Pf: () Exercise or use 2)

2) Observe that

$$f(x)+g(x) > \alpha \quad iff \quad f(x) > \alpha - g(x)$$

$$iff \quad f(x) > r > \alpha - g(x)$$

$$\exists red \quad f(x) > r > \alpha - g(x)$$

3) Final step: If
$$f$$
 is massivable, f^2 is measurable,
 $\alpha > 0$
 $\begin{cases} f^2 > \alpha \end{cases} = \begin{cases} f > J\alpha \end{cases} \bigcup \begin{cases} f < J\alpha \end{cases}$
many
 $\alpha < 0 \qquad \begin{cases} f^2 > \alpha \end{Bmatrix} = 0$

Given	fig mens:	
	2	
	$(f+g)^{2} = f^{2} + 2fg + g^{2}$	
	$fg = f^{2} + g^{2} - (f+g)^{2} \int dr m \cos \theta$	find
	2	· meriles.

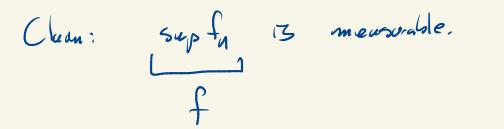
Given f, g, maasvalle,

R extended real numbers RU 200, -003 DER f: D-> R is mensurable of $f^{-1}((a, a))$ is menually for all $a \in \mathbb{R}$ 2fra3 Ó 10 - 00 4 ben $b + \infty = \infty$ -100 - 00 - -00 (x) + 0() = (x) () · as =)

-00 +00 euhoh

 $\int_{D}^{0} = 0 \quad 0 \cdot \partial = 0$

$$\{f_n\}_{n=1}^{\infty}$$
 $f_n: O \rightarrow \mathbb{R}$, meusunble.



¥

$$f_n(x) \leq \alpha \quad \forall n,$$

$$d \quad is \quad a \quad upper \ bound \quad for \quad \sum f_n(x); n = 1, \dots, \infty$$

$$f(x) = \quad \sup f(x) \leq \alpha,$$

$$\begin{cases} 20n3 \\ n \rightarrow sop \end{cases} = inf sup a_m \\ n \rightarrow sop \qquad n \quad un \neq q \end{cases}$$

Sure for lumint fr.

If $\xi f_n 3$ $f_n : D \to \mathbb{R}$ mensuable ad if $f_n \to f$ pointwise, then f is mensuable.

We say
$$f_n \rightarrow f$$
 pointwise a.e. if
there is a null set N and $f_n \rightarrow f$ pointwise
on D\N.
If $f_n \rightarrow f$ pointwise a.e. then S is measurable
 $f_n = \begin{cases} f_n & on D \setminus N \\ O & on N \end{cases}$
 $f_n = \begin{cases} f_n & on D \setminus N \\ O & on N \end{cases}$
 $f_n = \begin{cases} f_n & on D \setminus N \\ O & on N \end{cases}$
 $f_n = \begin{cases} f_n & on D \setminus N \\ O & on N \end{cases}$

$$f = \tilde{f}$$
 except on a subset of N ,
 $f = \tilde{f}$ o.e.

$$f^{+} = mux(f, 0)$$
 is measy
 $f^{-} = mux(f, 0)$ is measy

$$|f| = f^{+} - f^{-} \quad is meas.$$