P2
12 (a) Inner product space V () <f,g> = <g,f></g,f></f,g>
(0 < f, g) = < g, t >
inearity: < afi+bfz,5>
$=\frac{1}{\pi}\int_{-\pi}^{\pi}(af_i(t)+bf_i(t))g(t)dt$
= a[" filtiglight + b [" filtiglight
= a <f1,97 +="" b<f2,9=""></f1,97>
3 positive define: $\langle f, f \rangle = \frac{1}{\pi} \int_{-\pi}^{\pi} f^2 dt dt$
fit) >0 => cf,f7 >0
(b) 同(a), innor product space (
(c) 7£ imer prod space: Oan diverge, O €R
<u> </u>

P4 find two different inner products in R²

(dot product)
$$(x,y) = 7+y_1+y_1y_2$$

here (e_1,e_2) are orthonormal

fifth) $g(t)$ dt

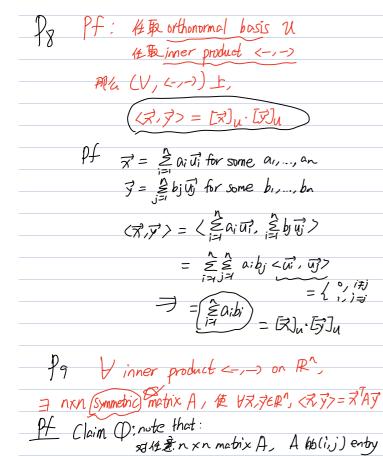
(3) different weight: $(x_1,y) = 37_1x_1 + 27_2y_2$

by $(\pi, f_1(t)) = f_1(t)$ dt

P5 Every finite dimensional inner product space

for $f_2(t) = f_1(t)$ dt

Take: $f_2(t) = f_1(t)$ dust in $f_2(t) = f_2(t)$ diverge, $f_2(t) = f_2(t)$



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