Proposition 1.8

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1. RINGS AND IDEALS

Fact. $a \in \mathfrak{p} + (x) \wedge b \in \mathfrak{p} + (y) \Rightarrow ab \in \mathfrak{p} + (xy)$

$a = c + dx$ with $c \in \mathfrak{p}$, $b = e + fy$ with $e \in \mathfrak{p}$; then $ab = (c + dx)(e + fy) = ce + cfy + dex + dfy$; but first three are in $\mathfrak{p}$ and last is in (xy).