Formatif_C_week1

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1 Proof

Prove that if m = $_{(n)}m'$ and $p =_{(n)} p'$ $then$ $mp =_{(n)} m'p'$
According to the definition,we have:
$m =_{(n)} p\ if\ n|(m-p))\ \ (a)$
So we just need to prove: $n|mp - m'p'$

Since
$mp - m'p' = mp - mp' + mp' - m'p'$
$= m(p - p') + p'(m - m')$
because $m =_{(n)} m'$ *and* $p =_{(n)} p'$ $\Rightarrow n|(p - p')$ *and* $n|(m - m')$
$\Rightarrow m(p - p') + p'(m - m') = mAn + p'Bn$ *where* $A, B \in \mathbb{Z}$
$\Rightarrow m(p - p') + p'(m - m') = (mA + p'B)n$
$\Rightarrow n|m(p - p') + p'(m - m')$
Since $m(p - p') + p'(m - m') = mp - m'p'$
$\Rightarrow n|mp - m'p'$
$\Rightarrow mp =_{(n)} m'p'$