Proof:-

a) The zero vector is unique.

$\Rightarrow$ Suppose by the way of contradiction that $\bar{u}$ & $\bar{v}$ are 2 distinct zero vectors.

Now: $\bar{u}+\bar{v} = \bar{u}$ —① , since $\bar{v}$ is a zero vector.

Similarly, $\bar{u}+\bar{v} = \bar{v}$ ② , since $\bar{u}$ is a zero vector

$\Rightarrow$ From ① & ②, $\bar{u} = \bar{v}$

Hence, Proved

c) $-\bar{u} = (-1)\bar{u}$

we know that the addition inverse of $\bar{u}$ is unique (one of the prev. part of proposition 7)

$\bar{u} + (-\bar{u}) = \bar{0}$ —①

$0 \cdot \bar{u} = \bar{0}$ (Part (c) of Proposition 7)

$(1+(-1))\,\bar{u} = \bar{0}$

$\Rightarrow 1 \cdot \bar{u} + (-1)\bar{u} = 0$

~~$1+(-1)$~~ $\bar{u} + (-1)\bar{u} = 0$ ② (Using axiom)

$\Rightarrow$ by ① & ②

$-\bar{u} = (-1)\bar{u}$