$\boxed{8.2}$

(3) Let P be a prime ideal of R.
Since P is a prime ideal we know that R/P is an integral domain. So, we just need to show that each ideal of R/P is principal.
Let $\overline{I} \subseteq R/P$ be an ideal. Consider the map $\pi : R \to R/P$ where $\pi(x) = x + P$.
Let $I = \pi^{-1}(\overline{I})$. Then I is an ideal of R. Since R is a PID, $I = (z)$ where $z \in R$.

<u>Claim:</u> $\overline{I} = (z+P)$.

<u>pf:</u> clearly $z+P \in \overline{I}$ since $z \in I$ and $z+P = \pi(z)$. Since $\overline{I}$ is an ideal $(z+P) \subseteq \overline{I}$.
Now let $y+P \in \overline{I}$. Then $y = \pi^{-1}(y+P) \in I$.
So, $y = rz$ for some $r \in R$. Hence
$y+P = rz+P = (r+P)(z+P) \in (z+P)$.
So, $\overline{I} \subseteq (z+P)$.

$\boxed{\text{W}}$