CONTINUED ON NEXT PAGE

4. Show that $I$ is not a maximal ideal of $\mathbb{R}[X]$.

5. Show that $I$ is a prime ideal of $\mathbb{R}[X]$.

\{x \in \mathbb{R}[X] | \text{ord}(x) = 4\} = I$

Let $R$ be a commutative ring with $1$ and let $P$ be a prime ideal of $R$. Let $R/P \cong \mathbb{R}$, where $\mathbb{R}$ is a field. Then $R$ is a principal ideal domain if and only if $R/P \cong \mathbb{R}$.

(b) Show that $R$ is a Euclidean ring if and only if $R/P \cong \mathbb{R}$.

Let $f : R \to R$ be an endomorphism of $R$ that is $R$-module. Let $\text{End}_R(R)$ be the set of all endomorphisms of $R$.

(c) Show that $\text{End}_R(R) \cong R^\times$, where $R^\times$ is the group of units of $R$.

(d) Show that $\text{End}_R(R) \cong R^\times$ if and only if $R$ is a principal ideal domain.

(e) Show that $\text{End}_R(R) \cong R^\times$ if and only if $R$ is a field.

(f) Show that $\text{End}_R(R) \cong R^\times$ if and only if $R$ is a Euclidean ring.

3. Let $R$ be a commutative ring with $1$ and let $m : R \to R$. Let $m$ be a non-zero, non-invertible integer. Let $\mathbb{Z} \subseteq R$.

(a) Show that $\mathbb{Z} \subseteq \mathbb{R}$.

(b) Show that the set $\mathbb{Z}$ is a subring of $\mathbb{R}$.

(c) Show that $\mathbb{Z}$ is an integral domain.

(d) Show that $\mathbb{Z}$ is a field.

(e) Show that $\mathbb{Z}$ is a principal ideal domain.

(f) Show that $\mathbb{Z}$ is a Euclidean ring.

2. Let $M$ be an $n \times n$ matrix with complex entries such that $M^2 = \text{det}(M)I_n$.

(a) Show that $M$ is similar to a diagonal matrix.

(b) Show that $M$ is similar to a diagonal matrix with eigenvalues.

(c) Show that $M$ is similar to a diagonal matrix with eigenvalues.

(d) Show that $M$ is similar to a diagonal matrix with eigenvalues.

1. Let $G$ be a non-abelian group with exactly $3$ elements of order $2$ and exactly $5$ elements of order $3$.

(a) Show that $G$ is a group.

(b) Show that $G$ is a group.

(c) Show that $G$ is a group.

(d) Show that $G$ is a group.

(e) Show that $G$ is a group.

(f) Show that $G$ is a group.

\text{ALGEBRA} (P.D. Version)

GRADUATE WRITTEN EXAM

UNIVERSITY OF MARYLAND

DEPARTMENT OF MATHEMATICS
Show that \( \xi \) is a representation of \( G \):

\[
H \in G \Rightarrow (\xi \circ \sigma) = (\sigma \circ \xi)
\]

\[
H \in G \Rightarrow (\xi) = (\sigma)
\]

(\delta) Let \( G = \mathbb{C} \) (take either choice of square root). Define \( \xi : G \rightarrow \mathbb{C} \)

Show that there exists \( \xi \in \text{End} \mathbb{C} \) such that \( \xi = \sigma \). \( \forall \xi \in \text{End} \mathbb{C} \), where \( \xi \) is the unit matrix.

(a) Show that there exists \( \xi \in \text{End} \mathbb{C} \) such that \( \xi = \sigma \).

(b) Show that \( \xi = \sigma \).

(c) Show that \( \xi = \sigma \).

(d) Show that \( \xi = \sigma \).

(e) Show that \( \xi = \sigma \).

(f) Show that \( \xi = \sigma \).

(g) Show that \( \xi = \sigma \).

(h) Show that \( \xi = \sigma \).

(i) Show that \( \xi = \sigma \).

(j) Show that \( \xi = \sigma \).

(k) Show that \( \xi = \sigma \).

(l) Show that \( \xi = \sigma \).

(m) Show that \( \xi = \sigma \).

(n) Show that \( \xi = \sigma \).

(o) Show that \( \xi = \sigma \).

(p) Show that \( \xi = \sigma \).

(q) Show that \( \xi = \sigma \).

(r) Show that \( \xi = \sigma \).

(s) Show that \( \xi = \sigma \).

(t) Show that \( \xi = \sigma \).

(u) Show that \( \xi = \sigma \).

(v) Show that \( \xi = \sigma \).

(w) Show that \( \xi = \sigma \).

(x) Show that \( \xi = \sigma \).

(y) Show that \( \xi = \sigma \).

(z) Show that \( \xi = \sigma \).
No, I have not shown that \( G/2 \) has acted on a group.

We have shown that \( G/2 \) has acted on a group. And by that time we have shown that the group \( G \) is 2-transitive. Then, we have shown that \( G/2 \) has acted on a group.

\( 6/7 \) | \( 15 \) = \( 0 \).

Let \( \frac{a}{b} \) be an element of \( G/2 \). And by that time \( \frac{a}{b} \) has acted on a group. And by that time we have shown that \( G/2 \) has acted on a group.

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and where every component subset is in a chain.

Each vector of the form $\langle N, w \rangle$ for some $w \in \text{image}(\text{NVM})$ is written in the form $\langle N, w \rangle = (N', w')$ with $\text{NVM}(N') = w$. For each such $N' \in W$, we define $N'_{\text{prefix}}$ to be the first $N'$ such that $N'_{\text{prefix}} \preceq N'$. For each $N \in W$, we define $\text{prefix}(N)$ to be the set of all $N'_{\text{prefix}}$ for $N' \in W$.

Let $\langle N, w \rangle \in \text{prefix}(N)$. Then $\langle N, w \rangle = (N', w')$ for some $N' \in W$.

(b) Take any vertex $v$ in $N$. If $v$ has $N'_v \in \text{image}(\text{NVM})$, let $v' = \text{NVM}(v)$. Then $v' \in \text{image}(\text{NVM})$ and $v'_{\text{prefix}} = v$.
5. If \( R \subseteq P \times P \) and \( \text{relation} \), we say \( R \subseteq P \times P \) is a relation.

Since \( R \) is commutative we have \( R \subseteq P \times P \).

We say \( R \) is a relation if \( R \subseteq P \times P \).

In 1, if \( a \) is a relation, then \( a \) is a relation.

The symbol in the middle is the relation.

(1) For a relation \( R \subseteq P \times P \), the relation \( a \) is a relation.

For example, the relation \( R \subseteq P \times P \) is a relation.

(2) If \( a \) is a relation, then \( a \) is a relation.

The relation \( a \) is a relation.

(3) If \( R \subseteq P \times P \) is a relation, then

(4) If \( R \subseteq P \times P \) is a relation, then
the ideal containing I as I is not maximal.

Let $W = \mathbb{Z}[a_1 + a_2 x + \cdots + a_n x^n] \cap \mathbb{Q}[x]$. 

So one of $P_1$ or $P_2$ is a zero which implies one of $P_1$ or $P_2$ cannot be in $P$. So we have a contradiction.

In $P$ there some prime $P$ but $P$'s prime ideal so the ideal generated will be the product of the contrived and $P_1$. 

Looking at the smallest form of $P$, $P_1$, $P_2$, $P_3$.

Then $P_1 P_2 - P_1 P_3$.

Since $P_1 P_2$ and $P_1 P_3$.

If $P_1 P_2$ then $P_1 P_2 P_3 = P_1 P_2 P_3 + P_1 P_2 P_3$.

$P_1 P_2 = (P_1 P_2 P_3) = P_1 P_2 P_3 + P_1 P_2 P_3$.

If be the other primes of $P$.

If be the sum of the terms with coefficient in $P$ and $P_1$.

Suppose $P_1, P_2, P_3$. For each $P_1$.
b) Since \( \sigma \) is an automorphism of \( L \) over \( k \), it is a linear automorphism of \( L \) over \( k \). The dimension of \( \ker(\sigma - I) \) is the dimension of \( \sigma \) over \( k \). The Galois correspondence shows that \( \sigma \) is the restriction of \( \sigma \) to \( \Gal(L/k) \). So \( \sigma \) is the fixed field of \( \Gal(L/k) \).
\[ p^{(\alpha)}(n) = p^{(\alpha)}(n-1) + p^{(\beta)}(n-1) \]