

() $\sim r \sim \text{nn} n \sim \sim r \sim r \text{nn} r \sim n \sim f \sim r \sim$, $\sim$
 $\sim r \sim r \sim n \sim n \sim r \text{nn} n \sim \text{nn} n \text{nn} r \sim f \sim \sim \text{nn} n$, n , $\sim n$
 $n \sim n - \text{nn} \sim n \sim r \sim n \sim \text{nn}$, $n \sim n \sim n \sim \sim \text{nn} n \sim \sim n (\sim n$, $\sim n$
 $\sim \text{nn} n \sim \sim n \sim f \sim r \sim \sim r \text{nn} n \sim \sim n \sim f \sim f \sim \sim r \sim \sim \sim n)$,

() $\sim \sim \sim r \sim \text{nn} n \sim \sim n \sim \sim r \sim \sim n \sim r n n \sim r \text{nn} r \sim \sim n$
 $\sim f \sim r n \sim n - \sim$, $\sim \sim r \sim r$,

() $\sim \sim \text{nn} n \sim n \sim r \sim \sim \text{nn} n \sim \sim n \sim r r n \sim \text{nn} n \sim r \sim n \sim$
 $\sim \text{nn} \sim \sim r r \text{nn} \sim f \sim r \sim r$, $\sim r \sim \sim r \sim n \sim n \sim r \text{nn} n \sim \text{nn} n$
 $\text{nn} \text{nn} r \sim f \sim r \sim r \text{nn} \sim n$, $\sim n$, $r \sim \sim r \sim n \sim n \sim$
 $r \sim n \sim n r$, $r \text{nn}$, $r \sim r$, $n \sim f n \sim \sim n \sim n$,
 $\sim \text{nn} n \sim \sim n \sim \sim r \sim \sim n \sim n \sim r \sim r$,

() $\sim n$, $r \sim \sim n \sim r \sim r \sim r \sim / r \sim \sim () \sim n \sim r \sim$
 $\sim n \sim r \text{nn} n n \sim / r \sim n r \text{nn} r \sim \sim n$,

() $\sim \sim \text{nn} n \sim r f \sim r \text{nn} n \sim \sim r \sim r$, $\sim r \sim \sim r \sim n \sim n \sim r$
 $\text{nn} n \sim \text{nn} n \text{nn} \text{nn} r \sim f \sim \sim \text{nn} n \sim n \sim \sim n$, $n n$, $r \sim$
 $\sim f \sim r \sim r f \sim r \text{nn} n$, n , $\sim n$, $r \sim$, $\sim \sim \text{nn}$, $\sim$
 $n n$, $r \text{nn} r \sim \sim n \sim n \sim f \sim r \sim r \sim n \sim \sim r$, $n \sim \text{nn} n \sim n$
 n , $\text{nn} \sim \sim \sim r \sim f \sim r \sim n \sim r \sim \sim n$, $n \sim \sim r$
 $\sim \text{nn} \text{nn} n \sim \sim n \sim f \sim f \sim r \text{nn} n \sim n \sim n$,

(10) $\sim$, $r \text{nn} r \sim \sim n \sim \sim f \sim \sim \text{nn} n \sim n \sim r \sim n$
 $\sim r \sim \sim \text{nn} \text{nn} n \sim \sim n$,

(11) $\sim \text{nn} n \sim r \text{nn} r \sim \sim n \sim \sim n \sim \text{nn} \sim r \sim n \sim$
 $\sim \text{nn} n \sim f \sim \text{nn} r \sim n \sim \sim \text{nn} n$,

(12) $\sim \sim n \sim \sim r \sim r \sim$, $r \text{nn} r \sim \sim n \sim f \sim r \sim r \sim n$
 $n \sim r \text{nn} n \sim \text{nn} n \text{nn} r$, n

(13) $\sim r$, $\sim$, $\sim r \sim \sim r$.

1. $\sim r \sim n \sim \sim n r \text{nn} r \sim \sim n \sim n \sim r r \sim$
 $\sim r \text{nn} \sim n r \sim f \sim r \sim r \sim f \sim \sim \text{nn} n$.

2. 10 $r \text{nn} r \sim \sim n \sim n \sim r r \sim \sim f \sim r \sim r \sim n$, $r \sim \sim r \sim f$
 $\sim \text{nn} n \sim r \sim \sim \sim \text{nn} \text{nn}$, $\text{nn} \sim \sim r \sim f \sim r$
 $r \sim n \sim n \sim r \sim n \sim r \sim r$, $n r \text{nn} n$
 $f \sim r \sim n \sim r \sim \sim n \sim r \sim f \sim r \sim \text{nn} \text{nn} n \sim \sim n$. $\text{nn} n r \sim \sim n \sim n$
 $f \sim r \sim n \sim r \text{nn} n \sim \text{nn} n \text{nn} r \sim f \sim \sim \text{nn} n \sim \sim$, $\text{nn} \sim$
 $\sim r \sim f \sim r \sim r$.

1
 , r f r n f
 r f . f r r n ,
 / r n r f rn n r r n
 n n n / r f rn
 n f r , n f , r n n r
 f f r f rn , n n r ff
 rn .

[illegible][illegible]

$\mathbb{Z}^n$ is a free $\mathbb{Z}$ -module of rank n . Let $\mathcal{B} = \{b_1, \dots, b_n\}$ be a basis for $\mathbb{Z}^n$. Then $\mathbb{Z}^n$ is isomorphic to the direct sum of n copies of $\mathbb{Z}$, i.e., $\mathbb{Z}^n \cong \mathbb{Z} \oplus \mathbb{Z} \oplus \dots \oplus \mathbb{Z}$.

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n r n n r n r n r n f n
r n , r n
n n r n r n nf r n . r
n r , n n n n r
r f n n n f n
r n n rr r fr

[illegible]

22 n n . r , r n _n . f _n . f
 n r r n r n _ n _n n
 n _n _r n n r , _n , r ,
 r , r r _n f () r n ' r r ,
 n r _n f r .

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2 μ r r n μ n. $\sim f$ $\sim \mu\mu$ n $\sim$ r n
 $\sim$ r r $\sim nf$ n μ r , μ n n
 n $\sim$ n r n $\sim nf$ $\mu\mu$ $\sim$ n $\sim$, , $\sim$ r $\sim$ n.



2 $\sim$ r , r $\sim$ $\sim f$ $\mu\mu$, r $\sim$ n $\sim$ | n , n μ r
 f $\sim$ n , r $\sim$ n, n μ r n f , f.

2 $\mu\mu$ n r $\sim$ $\sim$ r , $\sim$ n $\sim$ n $\sim$ r $\sim$ n n
 $\sim \mu$ ff $\sim$ fr $\mu\mu$ $\sim$ n $\sim$ r $\sim$ fr $\sim$ n r
 $\sim$, $\sim \mu$ n r n r $\sim$ n $\sim$ n $\sim f$
 $\sim$ n $\sim$ n μ . $\sim$ r $\sim$ r $\sim \mu$ n n n r r
 $\mu\mu$.

2 n μ r n $\sim$ $\sim$ r r n μ μ n n $\sim$ r n
 r n n r , $\sim$ n , r n r , $\sim$ r r $\sim$ n $\sim f$
 () r $\sim \mu$ n ' r r , n r . $\boxtimes$ r
 $\mu\mu$ $\sim nf$ n r n r , $\sim$ n , r n
 r , $\sim$ r r $\sim$ n $\sim f$ () r r $\sim f$ $\sim \mu$ n r
 $\sim$ n , n $\sim$ n , , $\sim$ r r , , r n n
 r , $\sim$ n , r n r , $\sim$ r r $\sim$ n $\sim f$ () r r
 $\sim f$ $\sim \mu$ n r n , n $\sim$ n , n r
 r , n μ μ n fr $\sim$ n , μ
 $\sim$ r fr $\sim$ n r $\sim$ n n r .

2, $\mu\mu$ r $\sim$ n $\sim$ n n $\sim$ r $\sim$ n . n $\sim f$
 $\sim$ n $\sim$ n $\sim$ n $\sim$ r $\sim$ n , $\sim$ n r $\sim$ n r .