59. Ya, bez abb=atb-lez 封河 (at b)DC = (a+b-1)0C = athtc-2a (bAc) =000(btc-1)=atbtc-2(afflight) = afflight) 、满足给律 Ades Gles a01= a+1-1=a 1100= a+1-1=a 二有级 HAEZ, JA+LEZ a 0(1-0)= a+1-0= Q(2-a) = a+2 - a-|=| $\alpha \theta b = b \theta a = atb -1$

·· <Z,由了是交换群 a&b = a+b 9 封闭 Ha, bez, a&b=atb-abez (0.80 b) 80 c = Latb-ab)&c = atb-abtc-(atb-ab)c = atb+c-ab-acobc +abc a@(b&c) =00(btc-bc) = atbtc-bc - a(btc-bc) -athtc-ab-ac-bc-tabe (0.0b) OC = 0.0(bOC) 满足结合律 · 〈思, ⑧〉为***** 含红丰祥 a Ya, b, coz a & (b +c) = QO(b+C-1)= a+b+c-1-a(b+c-1)=)atbtc-ab-ac-1 (alb) (alc) = (q+b-ab) f) (a+c-ac) =)a+b+c-ab-ac-1 0 0 (bOC) = (aQb) 0 (B a QC)

···〈Z, ①, ②)是私元的安换环 62 $\forall (x_1, y_2), (x_2, y_3) \in X$ (X,,y,)田(X,y,)=(X,+X,,Y,+y,) EX (計詞) (X,y,x),(X,y,),(X3,y,X)X ((X1, Y1)@(X3, Y2)) @(X3, Y3) = (X1+X14+Y1+Y2) @(X3, Y3) $=(\chi_1+\chi_1+\chi_3, y_1+y_1+y_3)$ $= (\chi_1, y_1) \oplus ((\chi_2, y_2) \oplus (\chi_3, y_3))$ 满足给律 X9(0,0)EX Y(Xy)EX (X, y) O(0,0)=(X, y)=(0,0) O(X, y) 在统 H(X,y) & X, 7 (-X, -y) & X H(X1,Y1),(X1, Y2) EX (X,y) (-X,-y)=(0,0) (X1, y1) E(X2, y2) = (X1, y3) E(X1, y3) = (X1, x2, 存在逆行 (藏)交换家 - : 〈X,@>潴释 (X2, y1), (X2, y2) GX (X1,191)@(X2,191)=(X1X1,19191)GX (封闭性) EX V(X1, Y1)(X2, Y1)(X3, Y3) EX (X,Y,)&((X,Y,)& (X1,Y3))=(X,Y,)&(X2,Y2)}@(X3,Y3) = (X,X2X3, Y,Y2Y3)

< Y, Ø) 游群	
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(X,y1) &(X,y1)=(X,y1) & (X,y1) = (X,X1,y1))
D 满足交换字	
$(X_1, Y_1) \otimes (X_2, Y_2) \oplus (X_1, Y_2) \otimes (X_2 + X_2, Y_3) = (X_1, Y_1) \otimes (X_2 + X_2, Y_3)$	Y2+95)=(X1(X2+X2),Y119.ty
= (X1, 4) D(X2, 42) A (X1, 4, 10) (X3, 43)	All Asabeta
= (X1X2 4, 4, 4) \$ (X1X3, 4,43)	
$= (\chi_1(\chi_1 + \chi_3), y_1(y_1 + y_3))$	
$(X_1, Y_1) \otimes ((X_2, Y_2) \oplus (X_3, Y_3)) = ((X_1, Y_1) \otimes (X_2, Y_2)$))((X1,y3)Q(X3,y3))
A A water カナムさ	
$\frac{\partial \mathcal{A}}{\partial x} \frac{\partial \mathcal{A}}{\partial x} \partial$	$\mathcal{Y} \oplus ((X_3, \mathcal{Y}_3), (X_1, \mathcal{Y}_1))$
60. (1).	
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B). HXVXEX XitXEZN XitXiZO 二くX, +7 封闭 EXPOR YOX, XLXEX (Xi+Xi)+X3=X1+(Xi1X3)=X1+X1+X3 · 满足给给 JUEX, YXEX, X+0=0+X=X ·· 有绝 子XEXDVXも VXCX, X+X, 7, X>0 70. ... 程每位素指验无... · くXi+7天は初かる ... < X,+,x> 不是雜认 14). Y XUXIEX XITX- (atb)+(a laitant (bitb)/NS aitazea, bith ea · · XITXI GX -: <X,+7针闭 (Xi+Xi)+X3=(Xi+(Xi+Xs)= (ai+1)ai+av+(bi+h+bs) \$\frac{1}{5}\$ 二满足结合律 7 a=0,b=0, x=0 Ex

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小松瘦的 :-<X,+,x7为整7/~。 68.11). 易知 Y X,XEX YitXEZ1Xitk70 ···<X,+7封局 JOEX, YXEX, X tO=OtX=X 二十存在纪0 HXEX. 若3X1eX X+ X-1=0 X+=-X<0 .当X70,X0在X中无经元 ~<X,+7不是群 - · < X, +, X7不足个域 (2).由的(5)路 くX+X7是大环 XT XVD 116 X180), YXG X180) $|X \times | = |X \times | = X$ 含红 YXEXIOIX3XY XIXXI-0/ XXX= (Q1 a1 +3 b1b1) + N3(Q1b+Q1b1)=

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50102 +3 b, b= 1 (B) arbitarbi=0 br = -br 60 = 0143 361 . XIEX .:. < X, x 7有逆元 由数乘的收漏和,满足交换等 ·· < X \{o}, x > 是 个交换群。 X-1<X,+,x7是一个证 ·· < X, +, x) 显城 13). \$\forall X, x7 YXIXEX XIXXI= (Oith, NS)(O) + b) NS) = 0,0,+(0,b,10,2b,))(5+ b,b,5= 0) ·· 开封闭 <X,t,X7不是域。 H1.同的可得, <X,+,X7是城 15/ AGO, 1 & X , 73/CX, RJ507 663 B RU \$XX£121 ··· < a.X, +, X > 不是t或

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