

# t1\_gcd\_1 (TMKjXDBkr- WiQzxsSJ47MzKpWJKaf2qBQ2DN)

October 27, 2020

Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v13\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $v3\_group\_1 : \iota \Rightarrow o$  be given. Let  $v5\_group\_1 : \iota \Rightarrow o$  be given. Let  $v4\_vectsp\_1 : \iota \Rightarrow o$  be given. Let  $v5\_vectsp\_1 : \iota \Rightarrow o$  be given. Let  $v2\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v3\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v4\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $v1\_vectsp\_2 : \iota \Rightarrow o$  be given. Let  $l6\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k4\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k8\_group\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v1\_vectsp\_1 : \iota \Rightarrow o$  be given. Let  $k6\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k4\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l2\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $k1\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l3\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l1\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $k3\_rlvect\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $l5\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l4\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l4\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l3\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $k5\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v2\_vectsp\_1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_rlvect\_1 \\ & X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v1\_vectsp\_1 X0) \wedge (l6\_algstr\_0 X0)))))) \Rightarrow \\ & (\forall X1. (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. (m1\_subset\_1 \\ & X2 (u1\_struct\_0 X0)) \Rightarrow (k6\_algstr\_0 X0 X1 (k4\_algstr\_0 X0 X2) = k4\_algstr\_0 \\ & X0 (k6\_algstr\_0 X0 X1 X2)))) \end{aligned} \tag{1}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_rlvect\_1 \\ & X0) \wedge ((v4\_rlvect\_1 X0) \wedge (l2\_algstr\_0 X0)))))) \Rightarrow (\forall X1. (m1\_subset\_1 \\ & X1 (u1\_struct\_0 X0)) \Rightarrow ((k1\_algstr\_0 X0 X1 (k4\_struct\_0 X0) = X1) \wedge \\ & (k1\_algstr\_0 X0 (k4\_struct\_0 X0) X1 = X1))) \end{aligned} \tag{2}$$

Assume the following.

$$\begin{aligned} & \forall X0. \forall X1. \forall X2. (((\neg v2\_struct\_0 X0) \wedge ((v5\_group\_1 \\ & X0) \wedge (l3\_algstr\_0 X0))) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge ( \\ & m1\_subset\_1 X2 (u1\_struct\_0 X0)))) \Rightarrow (k8\_group\_1 X0 X1 X2 = k6\_algstr\_0 \\ & X0 X1 X2) \end{aligned} \tag{3}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((v2\_rlvect\_1 X0)\wedge(l1\_algstr\_0 X0))\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow(k3\_rlvect\_1 X0 X1 X2 = k1\_algstr\_0 X0 X1 X2) \quad (4)$$

Assume the following.

$$\forall X0.(l6\_algstr\_0 X0)\Rightarrow((l2\_algstr\_0 X0)\wedge(l5\_algstr\_0 X0)) \quad (5)$$

Assume the following.

$$\forall X0.(l5\_algstr\_0 X0)\Rightarrow((l4\_algstr\_0 X0)\wedge(l4\_struct\_0 X0)) \quad (6)$$

Assume the following.

$$\forall X0.(l4\_algstr\_0 X0)\Rightarrow((l3\_struct\_0 X0)\wedge(l3\_algstr\_0 X0)) \quad (7)$$

Assume the following.

$$\forall X0.(l2\_algstr\_0 X0)\Rightarrow((l2\_struct\_0 X0)\wedge(l1\_algstr\_0 X0)) \quad (8)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((l3\_algstr\_0 X0)\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 (k6\_algstr\_0 X0 X1 X2) (u1\_struct\_0 X0)) \quad (9)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((l2\_algstr\_0 X0)\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 (k5\_algstr\_0 X0 X1 X2) (u1\_struct\_0 X0)) \quad (10)$$

Assume the following.

$$\forall X0.\forall X1.(((l2\_algstr\_0 X0)\wedge(m1\_subset\_1 X1 (u1\_struct\_0 X0)))\Rightarrow(m1\_subset\_1 (k4\_algstr\_0 X0 X1) (u1\_struct\_0 X0)) \quad (11)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((l1\_algstr\_0 X0)\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow(m1\_subset\_1 (k1\_algstr\_0 X0 X1 X2) (u1\_struct\_0 X0)) \quad (12)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0)\wedge(l6\_algstr\_0 X0))\Rightarrow((v1\_vectsp\_1 X0)\Leftrightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2. \\ (m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 \\ (u1\_struct\_0 X0))\Rightarrow(k6\_algstr\_0 X0 X1 (k1\_algstr\_0 X0 X2 X3) = k1\_algstr\_0 \\ X0 (k6\_algstr\_0 X0 X1 X2) (k6\_algstr\_0 X0 X1 X3)))))) \end{aligned} \quad (13)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge (l5\_algstr\_0 X0)) \Rightarrow ((v1\_vectsp\_2 \\ X0) \Leftrightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (\forall X2. \\ (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\neg(k6\_algstr\_0 X0 X1 X2 = k4\_struct\_0 \\ X0) \wedge ((X1 \neq k4\_struct\_0 X0) \wedge (X2 \neq k4\_struct\_0 X0)))))) \end{aligned} \quad (14)$$

Assume the following.

$$\begin{aligned} \forall X0.(l2\_algstr\_0 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 \\ X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (k5\_algstr\_0 \\ X0 X1 X2 = k1\_algstr\_0 X0 X1 (k4\_algstr\_0 X0 X2)))) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge (l2\_algstr\_0 X0)) \Rightarrow (\forall X1. \\ (m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow (((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 \\ X0) \wedge (v13\_algstr\_0 X0))) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ X0)) \Rightarrow ((X2 = k4\_algstr\_0 X0 X1) \Leftrightarrow (k1\_algstr\_0 X0 X1 X2 = k4\_struct\_0 \\ X0)))))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0) \wedge ((v5\_group\_1 \\ X0) \wedge (l3\_algstr\_0 X0))) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge ( \\ m1\_subset\_1 X2 (u1\_struct\_0 X0)))) \Rightarrow (k8\_group\_1 X0 X1 X2 = k8\_group\_1 \\ X0 X2 X1) \end{aligned} \quad (17)$$

Assume the following.

$$\begin{aligned} \forall X0.\forall X1.\forall X2.(((v2\_rlvect\_1 X0) \wedge (l1\_algstr\_0 \\ X0)) \wedge ((m1\_subset\_1 X1 (u1\_struct\_0 X0)) \wedge (m1\_subset\_1 X2 (u1\_struct\_0 \\ X0)))) \Rightarrow (k3\_rlvect\_1 X0 X1 X2 = k3\_rlvect\_1 X0 X2 X1) \end{aligned} \quad (18)$$

Assume the following.

$$\begin{aligned} \forall X0.(l6\_algstr\_0 X0) \Rightarrow (((\neg v2\_struct\_0 X0) \wedge (v5\_vectsp\_1 \\ X0)) \Rightarrow ((\neg v2\_struct\_0 X0) \wedge ((v1\_vectsp\_1 X0) \wedge (v2\_vectsp\_1 X0)))) \end{aligned} \quad (19)$$

**Theorem 1**

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge ((v13\_algstr\_0 X0) \wedge ((v3\_group\_1 \\ X0) \wedge ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge ((v5\_vectsp\_1 X0) \wedge ( \\ (v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 X0) \wedge ((v1\_vectsp\_2 \\ X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow (\forall X1.(m1\_subset\_1 X1 \\ (u1\_struct\_0 X0)) \Rightarrow (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow \\ (\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow ((X1 \neq k4\_struct\_0 \\ X0) \Rightarrow (((k8\_group\_1 X0 X1 X2 = k8\_group\_1 X0 X1 X3) \Rightarrow (X2 = X3)) \wedge ((k8\_group\_1 \\ X0 X2 X1 = k8\_group\_1 X0 X3 X1) \Rightarrow (X2 = X3))))))))) \end{aligned}$$