

## t32\_gcd\_1

(TMTTPP22u8uZJpvufjXGLsX8X6N9omgzx6sz)

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Let  $v2\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v6\_struct\_0 : \iota \Rightarrow o$  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  $v3\_gcd\_1 : \iota \Rightarrow o$  be given. Let  $l6\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $m2\_gcd\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k5\_gcd\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k5\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $l4\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r4\_gcd\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r3\_gcd\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v3\_vectsp\_1 : \iota \Rightarrow o$  be given. Let  $r2\_gcd\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $r1\_gcd\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $l2\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l5\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $l4\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l3\_struct\_0 : \iota \Rightarrow o$  be given. Let  $l3\_algstr\_0 : \iota \Rightarrow o$  be given. Let  $k6\_algstr\_0 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v6\_vectsp\_1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\ & X0) \wedge ((v3\_group\_1 X0) \wedge ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge (( \\ & v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 \\ & X0) \wedge ((v1\_vectsp\_2 X0) \wedge ((v3\_gcd\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow \quad (1) \\ & (\forall X1. (m2\_gcd\_1 X1 X0) \Rightarrow (\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 \\ & X0)) \Rightarrow (\forall X3. (m1\_subset\_1 X3 (u1\_struct\_0 X0)) \Rightarrow (k5\_gcd\_1 \\ & X0 X1 X2 X3 = k5\_gcd\_1 X0 X1 X3 X2)))) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall X0. ((\neg v2\_struct\_0 X0) \wedge ((v3\_group\_1 X0) \wedge ((v4\_vectsp\_1 \\ & X0) \wedge (l4\_algstr\_0 X0)))) \Rightarrow (\forall X1. (m2\_gcd\_1 X1 X0) \Rightarrow ((k5\_struct\_0 \\ & X0 \in X1) \wedge ((\forall X2. (m1\_subset\_1 X2 (u1\_struct\_0 X0)) \Rightarrow (\exists X3. \\ & (m2\_subset\_1 X3 (u1\_struct\_0 X0) X1) \wedge (r4\_gcd\_1 X0 X3 X2)))) \wedge (\forall X2. \\ & (m2\_subset\_1 X2 (u1\_struct\_0 X0) X1) \Rightarrow (\forall X3. (m2\_subset\_1 \\ & X3 (u1\_struct\_0 X0) X1) \Rightarrow (\neg (X2 \neq X3) \wedge (r3\_gcd\_1 X0 X2 X3)))))) \quad (2) \end{aligned}$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((v3\_vectsp\_1 X0)\wedge(l4\_algstr\_0 X0)))\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow(r2\_gcd\_1 X0 X1 X1)) \quad (3)$$

Assume the following.

$$\forall X0.\forall X1.\forall X2.(((\neg v2\_struct\_0 X0)\wedge((v3\_vectsp\_1 X0)\wedge(l4\_algstr\_0 X0)))\wedge((m1\_subset\_1 X1 (u1\_struct\_0 X0))\wedge(m1\_subset\_1 X2 (u1\_struct\_0 X0))))\Rightarrow((r2\_gcd\_1 X0 X1 X2)\Leftrightarrow(r1\_gcd\_1 X0 X1 X2))) \quad (4)$$

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.

$$\forall X0.(l3\_struct\_0 X0)\Rightarrow(m1\_subset\_1 (k5\_struct\_0 X0) (u1\_struct\_0 X0)) \quad (8)$$

Assume the following.

$$\forall X0.(((\neg v2\_struct\_0 X0)\wedge(l4\_algstr\_0 X0))\Rightarrow((v4\_vectsp\_1 X0)\Leftrightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow((k6\_algstr\_0 X0 X1 (k5\_struct\_0 X0) = X1)\wedge(k6\_algstr\_0 X0 (k5\_struct\_0 X0) X1 = X1)))))) \quad (9)$$

Assume the following.

$$\forall X0.(((\neg v2\_struct\_0 X0)\wedge(l3\_algstr\_0 X0))\Rightarrow(\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0))\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow((r1\_gcd\_1 X0 X1 X2)\Leftrightarrow(\exists X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0))\wedge(X2 = k6\_algstr\_0 X0 X1 X3))))))) \quad (10)$$

Assume the following.

$$\forall X0.(((\neg v2\_struct\_0 X0)\wedge((v3\_group\_1 X0)\wedge((v4\_vectsp\_1 X0)\wedge((v3\_gcd\_1 X0)\wedge(l4\_algstr\_0 X0))))))\Rightarrow(\forall X1.(m2\_gcd\_1 X1 X0)\Rightarrow(\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 X0))\Rightarrow(\forall X3.(m1\_subset\_1 X3 (u1\_struct\_0 X0))\Rightarrow(\forall X4.(m1\_subset\_1 X4 (u1\_struct\_0 X0))\Rightarrow((X4 = k5\_gcd\_1 X0 X1 X2 X3)\Leftrightarrow((X4 \in X1)\wedge((r2\_gcd\_1 X0 X4 X2)\wedge((r2\_gcd\_1 X0 X4 X3)\wedge(\forall X5.(m1\_subset\_1 X5 (u1\_struct\_0 X0))\Rightarrow((r2\_gcd\_1 X0 X5 X2)\wedge(r2\_gcd\_1 X0 X5 X3))\Rightarrow(r2\_gcd\_1 X0 X5 X4)))))))))))))) \quad (11)$$

Assume the following.

$$\begin{aligned} \forall X0.(l4\_algstr\_0 X0) \Rightarrow & (((\neg v2\_struct\_0 X0) \wedge (v4\_vectsp\_1 \\ X0)) \Rightarrow & ((\neg v2\_struct\_0 X0) \wedge ((v3\_vectsp\_1 X0) \wedge (v6\_vectsp\_1 X0)))) \end{aligned} \quad (12)$$

**Theorem 1**

$$\begin{aligned} \forall X0.((\neg v2\_struct\_0 X0) \wedge & ((\neg v6\_struct\_0 X0) \wedge ((v13\_algstr\_0 \\ X0) \wedge ((v3\_group\_1 X0) \wedge & ((v5\_group\_1 X0) \wedge ((v4\_vectsp\_1 X0) \wedge (( \\ v5\_vectsp\_1 X0) \wedge ((v2\_rlvect\_1 & X0) \wedge ((v3\_rlvect\_1 X0) \wedge ((v4\_rlvect\_1 \\ X0) \wedge ((v1\_vectsp\_2 X0) \wedge & ((v3\_gcd\_1 X0) \wedge (l6\_algstr\_0 X0)))))))))) \Rightarrow \\ (\forall X1.(m2\_gcd\_1 X1 X0) \Rightarrow & (\forall X2.(m1\_subset\_1 X2 (u1\_struct\_0 \\ X0)) \Rightarrow ((k5\_gcd\_1 X0 X1 X2 & (k5\_struct\_0 X0) = k5\_struct\_0 X0) \wedge (k5\_gcd\_1 \\ X0 X1 (k5\_struct\_0 X0) X2 = & k5\_struct\_0 X0)))) \end{aligned}$$