

# t22\_matrtop3 (TMaDyKpVpdMxM- PAWgz6bYfGurcDezV7zYnx)

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Let  $v1\_xreal\_0 : \iota \Rightarrow o$  be given. Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Let  $m1\_subset\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $u1\_struct\_0 : \iota \Rightarrow \iota$  be given. Let  $k15\_euclid : \iota \Rightarrow \iota$  be given. Let  $r1\_xxreal\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $np\_1 : \iota$  be given. Let  $k1\_seq\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k3\_matrtop1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k2\_matrtop3 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k7\_real\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k8\_real\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k17\_sin\_cos : \iota \Rightarrow \iota$  be given. Let  $k20\_sin\_cos : \iota \Rightarrow \iota$  be given. Let  $v3\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $v2\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xxreal\_0 : \iota \Rightarrow o$  be given. Let  $v1\_xcmplx\_0 : \iota \Rightarrow o$  be given. Let  $k3\_xcmplx\_0 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k6\_numbers : \iota$  be given. Let  $k1\_xboole\_0 : \iota$  be given. Let  $k4\_ordinal1 : \iota$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v3\_card\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_finseq\_1 : \iota \Rightarrow o$  be given. Let  $v3\_valued\_0 : \iota \Rightarrow o$  be given. Let  $m1\_matrix\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_vectsp\_1 : \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k13\_fvsum\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k1\_matrtop1 : \iota \Rightarrow \iota$  be given. Let  $k9\_matrix\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $m2\_subset\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_numbers : \iota$  be given. Let  $k5\_numbers : \iota$  be given. Let  $np\_0 : \iota$  be given. Let  $k4\_xcmplx\_0 : \iota \Rightarrow \iota$  be given. Let  $v1\_xboole\_0 : \iota \Rightarrow o$  be given. Let  $v1\_funct\_2 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_zfmisc\_1 : \iota \Rightarrow \iota$  be given. Let  $k2\_zfmisc\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $v4\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v5\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_partfun1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v1\_topreal9 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v2\_monoid\_0 : \iota \Rightarrow o$  be given. Let  $v5\_rltopsp1 : \iota \Rightarrow o$  be given. Let  $l1\_rltopsp1 : \iota \Rightarrow o$  be given. Let  $l1\_rlvect\_1 : \iota \Rightarrow o$  be given. Let  $l1\_pre_topc : \iota \Rightarrow o$  be given. Let  $l1\_struct\_0 : \iota \Rightarrow o$  be given. Let  $v1\_matrix\_6 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $v3\_membered : \iota \Rightarrow o$  be given. Let  $v1\_monoid\_0 : \iota \Rightarrow o$  be given. Assume the following.

$$\forall X0.(v1\_xreal\_0 X0) \Rightarrow (\forall X1.(v1\_xreal\_0 X1) \Rightarrow (\neg(\neg r1\_xxreal\_0 X0 X1) \wedge ((\neg v3\_xxreal\_0 X1) \wedge (\neg v2\_xxreal\_0 X0)))) \quad (1)$$

Assume the following.

$$\forall X0.(v1\_xxreal\_0 X0) \Rightarrow (\forall X1.(v1\_xxreal\_0 X1) \Rightarrow (\forall X2.(v1\_xxreal\_0 X2) \Rightarrow (((r1\_xxreal\_0 X0 X1) \wedge (r1\_xxreal\_0 X1 X2)) \Rightarrow (r1\_xxreal\_0 X0 X2)))) \quad (2)$$

Assume the following.

$$\forall X0.(v1\_xcmplx\_0 X0) \Rightarrow (k3\_xcmplx\_0 X0 \ k6\_numbers = k6\_numbers) \quad (3)$$

Assume the following.

$$m1\_subset\_1 \ k1\_xboole\_0 \ k4\_ordinal1 \quad (4)$$

Assume the following.

$$\begin{aligned} \forall X0.(v7\_ordinal1 \ X0) \Rightarrow (\forall X1.(v7\_ordinal1 \ X1) \Rightarrow (\forall X2. \\ (v7\_ordinal1 \ X2) \Rightarrow (\forall X3.((v1\_relat\_1 \ X3) \wedge ((v1\_funct\_1 \\ X3) \wedge ((v3\_card\_1 \ X3 \ X2) \wedge ((v1\_finseq\_1 \ X3) \wedge (v3\_valued\_0 \ X3)))))) \Rightarrow \\ (\forall X4.(m1\_matrix\_1 \ X4 \ (u1\_struct\_0 \ k2\_vectsp\_1) \ X2 \ X1) \Rightarrow \\ (((r1\_xxreal\_0 \ np\_1 \ X0) \wedge (r1\_xxreal\_0 \ X0 \ X1)) \Rightarrow ((X2 = k6\_numbers) \vee \\ (k1\_funct\_1 \ (k1\_funct\_1 \ (k3\_matrtop1 \ X2 \ X1 \ X4) \ X3) \ X0 = k13\_fvsum\_1 \\ k2\_vectsp\_1 \ (k1\_matrtop1 \ X3) \ (k9\_matrix\_1 \ (u1\_struct\_0 \ k2\_vectsp\_1) \\ X4 \ X0))))))))) \quad (5) \end{aligned}$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xreal\_0 \ X0) \Rightarrow (\forall X1.(v7\_ordinal1 \ X1) \Rightarrow (\forall X2. \\ (v7\_ordinal1 \ X2) \Rightarrow (\forall X3.(v7\_ordinal1 \ X3) \Rightarrow (\forall X4.( \\ m1\_subset\_1 \ X4 \ (u1\_struct\_0 \ (k15\_euclid \ X3))) \Rightarrow (((r1\_xxreal\_0 \\ np\_1 \ X1) \wedge (r1\_xxreal\_0 \ X2 \ X3)) \Rightarrow ((r1\_xxreal\_0 \ X2 \ X1) \vee (k13\_fvsum\_1 \\ k2\_vectsp\_1 \ (k1\_matrtop1 \ X4) \ (k9\_matrix\_1 \ (u1\_struct\_0 \ k2\_vectsp\_1) \\ (k2\_matrtop3 \ X3 \ X0 \ X1 \ X2) \ X2) = k7\_real\_1 \ (k8\_real\_1 \ (k1\_seq\_1 \ X4 \\ X1) \ (k17\_sin\_cos \ X0)) \ (k8\_real\_1 \ (k1\_seq\_1 \ X4 \ X2) \ (k20\_sin\_cos \\ X0))))))))) \quad (6) \end{aligned}$$

Assume the following.

$$\begin{aligned} ((v2\_xxreal\_0 \ np\_1) \wedge (m2\_subset\_1 \ np\_1 \ k1\_numbers \ k5\_numbers)) \wedge \\ ((m1\_subset\_1 \ np\_1 \ k5\_numbers) \wedge (m1\_subset\_1 \ np\_1 \ k1\_numbers)) \quad (7) \end{aligned}$$

Assume the following.

$$(m2\_subset\_1 \ np\_0 \ k1\_numbers \ k5\_numbers) \wedge ((m1\_subset\_1 \ np\_0 \ k5\_numbers) \wedge (m1\_subset\_1 \ np\_0 \ k1\_numbers)) \quad (8)$$

Assume the following.

$$k4\_xcmplx\_0 \ np\_0 = np\_0 \quad (9)$$

Assume the following.

$$k6\_numbers = k1\_xboole\_0 \quad (10)$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \quad (11)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1\_xboole\_0 X0)\wedge \\ & (((v1\_funct\_1 X2)\wedge((v1\_funct\_2 X2 X0 X1)\wedge(m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X1))))))\wedge(m1\_subset\_1 X3 X0)))\Rightarrow(k3\_funct\_2 X0 \\ & X1 X2 X3 = k1\_funct\_1 X2 X3) \end{aligned} \quad (12)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1 X0)\wedge((v1\_funct\_1 X0)\wedge(v3\_valued\_0 X0)))\Rightarrow(k1\_seq\_1 X0 X1 = k1\_funct\_1 X0 X1) \quad (13)$$

Assume the following.

$$\begin{aligned} & \forall X0.(v7\_ordinal1 X0)\Rightarrow(\exists X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (u1\_struct\_0 (k15\_euclid X0)) (u1\_struct\_0 (k15\_euclid \\ & X0))))))\wedge((\neg v1\_xboole\_0 X1)\wedge((v1\_relat\_1 X1)\wedge((v4\_relat\_1 X1 \\ & (u1\_struct\_0 (k15\_euclid X0)))\wedge((v5\_relat\_1 X1 (u1\_struct\_0 \\ & (k15\_euclid X0)))\wedge((v1\_funct\_1 X1)\wedge((v1\_partfun1 X1 (u1\_struct\_0 \\ & (k15\_euclid X0)))\wedge((v1\_funct\_2 X1 (u1\_struct\_0 (k15\_euclid X0)) \\ & (u1\_struct\_0 (k15\_euclid X0)))))))))) \end{aligned} \quad (14)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0)\Rightarrow((v2\_monoid\_0 (k15\_euclid X0))\wedge (v5\_rltopsp1 (k15\_euclid X0))) \quad (15)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_xxreal\_0 X0)\wedge(v1\_xreal\_0 X0))\wedge \\ & ((\neg v3\_xxreal\_0 X1)\wedge(v1\_xreal\_0 X1)))\Rightarrow(\neg v2\_xxreal\_0 (k3\_xcmplx\_0 \\ & X0 X1)) \end{aligned} \quad (16)$$

Assume the following.

$$\forall X0.((\neg v3\_xxreal\_0 X0)\wedge(v1\_xreal\_0 X0))\Rightarrow((v1\_xcmplx\_0 (k4\_xcmplx\_0 X0))\wedge(\neg v2\_xxreal\_0 (k4\_xcmplx\_0 X0))) \quad (17)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((v7\_ordinal1 X0)\wedge \\ & ((v7\_ordinal1 X1)\wedge(m1\_matrix\_1 X2 (u1\_struct\_0 k2\_vectsp\_1 \\ & X0 X1)))\Rightarrow((v1\_finseq\_1 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3))\wedge \\ & (v3\_valued\_0 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3))) \end{aligned} \quad (18)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((v7\_ordinal1 X0)\wedge \\ & ((v7\_ordinal1 X1)\wedge(m1\_matrix\_1 X2 (u1\_struct\_0 k2\_vectsp\_1 \\ & X0 X1)))\Rightarrow((v1\_relat\_1 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3))\wedge \\ & (v1\_funct\_1 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3))) \end{aligned} \quad (19)$$

Assume the following.

$$\forall X0.(l1\_rltopsp1\ X0)\Rightarrow((l1\_rlvect\_1\ X0)\wedge(l1\_pre\_topc\ X0)) \quad (20)$$

Assume the following.

$$\forall X0.(l1\_pre\_topc\ X0)\Rightarrow(l1\_struct\_0\ X0) \quad (21)$$

Assume the following.

$$m1\_subset\_1\ k5\_numbers\ (k1\_zfmisc\_1\ k1\_numbers) \quad (22)$$

Assume the following.

$$\begin{aligned} &\forall X0.\forall X1.\forall X2.((v7\_ordinal1\ X0)\wedge((v7\_ordinal1 \\ &X1)\wedge(m1\_matrix\_1\ X2\ (u1\_struct\_0\ k2\_vectsp\_1)\ X0\ X1)))\Rightarrow((v1\_funct\_1 \\ &(k3\_matrtop1\ X0\ X1\ X2))\wedge((v1\_funct\_2\ (k3\_matrtop1\ X0\ X1\ X2)\ (u1\_struct\_0 \\ &(k15\_euclid\ X0))\ (u1\_struct\_0\ (k15\_euclid\ X1)))\wedge(m1\_subset\_1 \\ &(k3\_matrtop1\ X0\ X1\ X2)\ (k1\_zfmisc\_1\ (k2\_zfmisc\_1\ (u1\_struct\_0 \\ &(k15\_euclid\ X0))\ (u1\_struct\_0\ (k15\_euclid\ X1)))))) \end{aligned} \quad (23)$$

Assume the following.

$$\begin{aligned} &\forall X0.\forall X1.\forall X2.\forall X3.((v7\_ordinal1\ X0)\wedge \\ &((v1\_xreal\_0\ X1)\wedge((v7\_ordinal1\ X2)\wedge(v7\_ordinal1\ X3))))\Rightarrow((v1\_matrix\_6 \\ &(k2\_matrtop3\ X0\ X1\ X2\ X3)\ X0\ k2\_vectsp\_1)\wedge(m1\_matrix\_1\ (k2\_matrtop3 \\ &X0\ X1\ X2\ X3)\ (u1\_struct\_0\ k2\_vectsp\_1)\ X0\ X0)) \end{aligned} \quad (24)$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow((v5\_rltopsp1\ (k15\_euclid\ X0))\wedge(l1\_rltopsp1\ (k15\_euclid\ X0))) \quad (25)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xreal\_0\ X0)\wedge(v1\_xreal\_0\ X1))\Rightarrow((r1\_xreal\_0\ X0\ X1)\vee(r1\_xreal\_0\ X1\ X0)) \quad (26)$$

Assume the following.

$$\forall X0.(m1\_subset\_1\ X0\ (k1\_zfmisc\_1\ k1\_numbers))\Rightarrow(v3\_membered\ X0) \quad (27)$$

Assume the following.

$$\forall X0.(v1\_xboole\_0\ X0)\Rightarrow(\forall X1.((v1\_relat\_1\ X1)\wedge(v4\_relat\_1\ X1\ X0))\Rightarrow((v1\_xboole\_0\ X1)\wedge((v1\_relat\_1\ X1)\wedge(v4\_relat\_1\ X1\ X0)))) \quad (28)$$

Assume the following.

$$\forall X0.(v1\_xreal\_0\ X0)\Rightarrow(v1\_xreal\_0\ X0) \quad (29)$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k15\_euclid\ X0)))\Rightarrow(v3\_card\_1\ X1\ X0)) \quad (30)$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k15\_euclid\ X0)))\Rightarrow(v3\_valued\_0\ X1)) \quad (31)$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow(v1\_xxreal\_0\ X0) \quad (32)$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow(v1\_xreal\_0\ X0) \quad (33)$$

Assume the following.

$$\forall X0.(m1\_subset\_1\ X0\ k5\_numbers)\Rightarrow(\neg v3\_xxreal\_0\ X0) \quad (34)$$

Assume the following.

$$\forall X0.(l1\_struct\_0\ X0)\Rightarrow((v2\_monoid\_0\ X0)\Rightarrow(v1\_monoid\_0\ X0)) \quad (35)$$

Assume the following.

$$\forall X0.(v7\_ordinal1\ X0)\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ (k15\_euclid\ X0)))\Rightarrow(v1\_finseq\_1\ X1)) \quad (36)$$

Assume the following.

$$\forall X0.(m1\_subset\_1\ X0\ k1\_numbers)\Rightarrow(v1\_xreal\_0\ X0) \quad (37)$$

Assume the following.

$$\forall X0.((v1\_monoid\_0\ X0)\wedge(l1\_struct\_0\ X0))\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ (u1\_struct\_0\ X0))\Rightarrow((v1\_relat\_1\ X1)\wedge(v1\_funct\_1\ X1))) \quad (38)$$

Assume the following.

$$\forall X0.(v3\_membered\ X0)\Rightarrow(\forall X1.(m1\_subset\_1\ X1\ X0)\Rightarrow(v1\_xreal\_0\ X1)) \quad (39)$$

**Theorem 1**

$$\forall X0.(v1\_xreal\_0\ X0)\Rightarrow(\forall X1.(v7\_ordinal1\ X1)\Rightarrow(\forall X2.(v7\_ordinal1\ X2)\Rightarrow(\forall X3.(v7\_ordinal1\ X3)\Rightarrow(\forall X4.(m1\_subset\_1\ X4\ (u1\_struct\_0\ (k15\_euclid\ X3)))\Rightarrow(((r1\_xxreal\_0\ np\_1\ X1)\wedge(r1\_xxreal\_0\ X2\ X3))\Rightarrow((r1\_xxreal\_0\ X2\ X1)\vee(k1\_seq\_1\ (k3\_funct\_2\ (u1\_struct\_0\ (k15\_euclid\ X3))\ (u1\_struct\_0\ (k15\_euclid\ X3))\ (k3\_matrtop1\ X3\ X3\ (k2\_matrtop3\ X3\ X0\ X1\ X2))\ X4)\ X2 = k7\_real\_1\ (k8\_real\_1\ (k1\_seq\_1\ X4\ X1)\ (k17\_sin\_cos\ X0))\ (k8\_real\_1\ (k1\_seq\_1\ X4\ X2)\ (k20\_sin\_cos\ X0))))))))))$$