

# t21\_matrtop3

(TMN33oaSPDLvhXEnXvgnMY4yNwwBJsGHxmn)

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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  $k20\_sin\_cos : \iota \Rightarrow \iota$  be given. Let  $k4\_xcmplx\_0 : \iota \Rightarrow \iota$  be given. Let  $k17\_sin\_cos : \iota \Rightarrow \iota$  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  $m1\_matrix\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k2\_vectsp\_1 : \iota$  be given. Let  $k1\_funct\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $k13\_fvsom\_1 : \iota \Rightarrow \iota \Rightarrow \iota \Rightarrow \iota$  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  $v1\_xboole\_0 : \iota \Rightarrow o$  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.

$$\forall X0.(v1\_xreal\_0 X0) \Rightarrow (\forall X1.(v1\_xreal\_0 X1) \Rightarrow (((r1\_xxreal\_0 X0 X1) \wedge (v2\_xxreal\_0 X0)) \Rightarrow (v2\_xxreal\_0 X1))) \quad (4)$$

Assume the following.

$$m1\_subset\_1 \ k1\_xboole\_0 \ k4\_ordinal1 \quad (5)$$

Assume the following.

$$\begin{aligned} \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.(v7\_ordinal1 X1) \Rightarrow (\forall X2. \\ (v7\_ordinal1 X2) \Rightarrow (\forall X3.((v1\_relat\_1 X3) \wedge ((v1\_funct\_1 \\ X3) \wedge ((v3\_card\_1 X3 X2) \wedge ((v1\_finseq\_1 X3) \wedge (v3\_valued\_0 X3)))))) \Rightarrow \\ (\forall X4.(m1\_matrix\_1 X4 (u1\_struct\_0 k2\_vectsp\_1) X2 X1) \Rightarrow \\ (((r1\_xxreal\_0 np\_1 X0) \wedge (r1\_xxreal\_0 X0 X1)) \Rightarrow ((X2 = k6\_numbers) \vee \\ (k1\_funct\_1 (k1\_funct\_1 (k3\_matrtop1 X2 X1 X4) X3) X0 = k13\_fvsu1 \\ k2\_vectsp\_1 (k1\_matrtop1 X3) (k9\_matrix\_1 (u1\_struct\_0 k2\_vectsp\_1) \\ X4 X0)))))))))) \end{aligned} \quad (6)$$

Assume the following.

$$\begin{aligned} \forall X0.(v1\_xreal\_0 X0) \Rightarrow (\forall X1.(v7\_ordinal1 X1) \Rightarrow (\forall X2. \\ (v7\_ordinal1 X2) \Rightarrow (\forall X3.(v7\_ordinal1 X3) \Rightarrow (\forall X4.( \\ m1\_subset\_1 X4 (u1\_struct\_0 (k15\_euclid X3))) \Rightarrow (((r1\_xxreal\_0 \\ np\_1 X1) \wedge (r1\_xxreal\_0 X2 X3)) \Rightarrow ((r1\_xxreal\_0 X2 X1) \vee (k13\_fvsu1 \\ k2\_vectsp\_1 (k1\_matrtop1 X4) (k9\_matrix\_1 (u1\_struct\_0 k2\_vectsp\_1) \\ (k2\_matrtop3 X3 X0 X1 X2) X1) = k7\_real\_1 (k8\_real\_1 (k1\_seq\_1 X4 \\ X1) (k20\_sin\_cos X0)) (k8\_real\_1 (k1\_seq\_1 X4 X2) (k4\_xcmplx\_0 \\ (k17\_sin\_cos X0)))))))))) \end{aligned} \quad (7)$$

Assume the following.

$$\begin{aligned} ((v2\_xxreal\_0 np\_1) \wedge (m2\_subset\_1 np\_1 \ k1\_numbers \ k5\_numbers)) \wedge \\ ((m1\_subset\_1 np\_1 \ k5\_numbers) \wedge (m1\_subset\_1 np\_1 \ k1\_numbers)) \end{aligned} \quad (8)$$

Assume the following.

$$(m2\_subset\_1 np\_0 \ k1\_numbers \ k5\_numbers) \wedge ((m1\_subset\_1 np\_0 \ k5\_numbers) \wedge (m1\_subset\_1 np\_0 \ k1\_numbers)) \quad (9)$$

Assume the following.

$$k4\_xcmplx\_0 \ np\_0 = np\_0 \quad (10)$$

Assume the following.

$$k6\_numbers = k1\_xboole\_0 \quad (11)$$

Assume the following.

$$k5\_numbers = k4\_ordinal1 \quad (12)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((\neg v1\_xboole\_0 X0) \wedge \\ & (((v1\_funct\_1 X2) \wedge ((v1\_funct\_2 X2 X0 X1) \wedge (m1\_subset\_1 X2 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 X0 X1)))))) \wedge (m1\_subset\_1 X3 X0))) \Rightarrow (k3\_funct\_2 X0 \\ & X1 X2 X3 = k1\_funct\_1 X2 X3) \end{aligned} \quad (13)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v3\_valued\_0 X0))) \Rightarrow (k1\_seq\_1 X0 X1 = k1\_funct\_1 X0 X1) \quad (14)$$

Assume the following.

$$\begin{aligned} & \forall X0.(v7\_ordinal1 X0) \Rightarrow (\exists X1.(m1\_subset\_1 X1 (k1\_zfmisc\_1 \\ & (k2\_zfmisc\_1 (u1\_struct\_0 (k15\_euclid X0)) (u1\_struct\_0 (k15\_euclid \\ & X0)))))) \wedge ((\neg v1\_xboole\_0 X1) \wedge ((v1\_relat\_1 X1) \wedge ((v4\_relat\_1 X1 \\ & (u1\_struct\_0 (k15\_euclid X0))) \wedge ((v5\_relat\_1 X1 (u1\_struct\_0 \\ & (k15\_euclid X0))) \wedge ((v1\_funct\_1 X1) \wedge ((v1\_partfun1 X1 (u1\_struct\_0 \\ & (k15\_euclid X0))) \wedge ((v1\_funct\_2 X1 (u1\_struct\_0 (k15\_euclid X0)) \\ & (u1\_struct\_0 (k15\_euclid X0))) \wedge (v1\_topreal9 X1 X0)))))))))) \end{aligned} \quad (15)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Rightarrow ((v2\_monoid\_0 (k15\_euclid X0)) \wedge (v5\_rltopsp1 (k15\_euclid X0))) \quad (16)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.(((\neg v2\_xxreal\_0 X0) \wedge (v1\_xreal\_0 X0)) \wedge \\ & ((\neg v3\_xxreal\_0 X1) \wedge (v1\_xreal\_0 X1))) \Rightarrow (\neg v2\_xxreal\_0 (k3\_xcmplx\_0 \\ & X0 X1)) \end{aligned} \quad (17)$$

Assume the following.

$$\forall X0.((\neg v3\_xxreal\_0 X0) \wedge (v1\_xreal\_0 X0)) \Rightarrow ((v1\_xcmplx\_0 (k4\_xcmplx\_0 X0)) \wedge (\neg v2\_xxreal\_0 (k4\_xcmplx\_0 X0))) \quad (18)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((v7\_ordinal1 X0) \wedge \\ & ((v7\_ordinal1 X1) \wedge (m1\_matrix\_1 X2 (u1\_struct\_0 k2\_vectsp\_1 \\ & X0 X1))) \Rightarrow ((v1\_finseq\_1 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3)) \wedge \\ & (v3\_valued\_0 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3))) \end{aligned} \quad (19)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((v7\_ordinal1 X0)\wedge \\ & ((v7\_ordinal1 X1)\wedge(m1\_matrix\_1 X2 (u1\_struct\_0 k2\_vectsp\_1) \\ & X0 X1)))\Rightarrow((v1\_relat\_1 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3))\wedge \\ & (v1\_funct\_1 (k1\_funct\_1 (k3\_matrtop1 X0 X1 X2) X3))) \end{aligned} \quad (20)$$

Assume the following.

$$\forall X0.(l1\_rltopsp1 X0)\Rightarrow((l1\_rlvect\_1 X0)\wedge(l1\_pre\_topc X0)) \quad (21)$$

Assume the following.

$$\forall X0.(l1\_pre\_topc X0)\Rightarrow(l1\_struct\_0 X0) \quad (22)$$

Assume the following.

$$m1\_subset\_1 k5\_numbers (k1\_zfmisc\_1 k1\_numbers) \quad (23)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.((v7\_ordinal1 X0)\wedge((v7\_ordinal1 \\ & X1)\wedge(m1\_matrix\_1 X2 (u1\_struct\_0 k2\_vectsp\_1) X0 X1)))\Rightarrow((v1\_funct\_1 \\ & (k3\_matrtop1 X0 X1 X2))\wedge((v1\_funct\_2 (k3\_matrtop1 X0 X1 X2) (u1\_struct\_0 \\ & (k15\_euclid X0)) (u1\_struct\_0 (k15\_euclid X1))))\wedge(m1\_subset\_1 \\ & (k3\_matrtop1 X0 X1 X2) (k1\_zfmisc\_1 (k2\_zfmisc\_1 (u1\_struct\_0 \\ & (k15\_euclid X0)) (u1\_struct\_0 (k15\_euclid X1)))))) \end{aligned} \quad (24)$$

Assume the following.

$$\begin{aligned} & \forall X0.\forall X1.\forall X2.\forall X3.((v7\_ordinal1 X0)\wedge \\ & ((v1\_xreal\_0 X1)\wedge((v7\_ordinal1 X2)\wedge(v7\_ordinal1 X3))))\Rightarrow((v1\_matrix\_6 \\ & (k2\_matrtop3 X0 X1 X2 X3) X0 k2\_vectsp\_1)\wedge(m1\_matrix\_1 (k2\_matrtop3 \\ & X0 X1 X2 X3) (u1\_struct\_0 k2\_vectsp\_1) X0 X0)) \end{aligned} \quad (25)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0)\Rightarrow((v5\_rltopsp1 (k15\_euclid X0))\wedge(l1\_rltopsp1 (k15\_euclid X0))) \quad (26)$$

Assume the following.

$$\forall X0.\forall X1.((v1\_xreal\_0 X0)\wedge(v1\_xreal\_0 X1))\Rightarrow((r1\_xreal\_0 X0 X1)\vee(r1\_xreal\_0 X1 X0)) \quad (27)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 X0 (k1\_zfmisc\_1 k1\_numbers))\Rightarrow(v3\_membered X0) \quad (28)$$

Assume the following.

$$\forall X0.(v1\_xboole\_0 X0) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge (v4\_relat\_1 X1 X0)) \Rightarrow ((v1\_xboole\_0 X1) \wedge ((v1\_relat\_1 X1) \wedge (v4\_relat\_1 X1 X0)))) \quad (29)$$

Assume the following.

$$\forall X0.(v1\_xreal\_0 X0) \Rightarrow (v1\_xxreal\_0 X0) \quad (30)$$

Assume the following.

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

Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 (k15\_euclid X0))) \Rightarrow (v3\_valued\_0 X1)) \quad (32)$$

Assume the following.

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

Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Rightarrow (v1\_xreal\_0 X0) \quad (34)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 X0 k5\_numbers) \Rightarrow (\neg v3\_xxreal\_0 X0) \quad (35)$$

Assume the following.

$$\forall X0.(l1\_struct\_0 X0) \Rightarrow ((v2\_monoid\_0 X0) \Rightarrow (v1\_monoid\_0 X0)) \quad (36)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 (k15\_euclid X0))) \Rightarrow (v1\_finseq\_1 X1)) \quad (37)$$

Assume the following.

$$\forall X0.(m1\_subset\_1 X0 k1\_numbers) \Rightarrow (v1\_xreal\_0 X0) \quad (38)$$

Assume the following.

$$\forall X0.((v1\_monoid\_0 X0) \wedge (l1\_struct\_0 X0)) \Rightarrow (\forall X1.(m1\_subset\_1 X1 (u1\_struct\_0 X0)) \Rightarrow ((v1\_relat\_1 X1) \wedge (v1\_funct\_1 X1))) \quad (39)$$

Assume the following.

$$\forall X0.(v3\_membered X0) \Rightarrow (\forall X1.(m1\_subset\_1 X1 X0) \Rightarrow (v1\_xreal\_0 X1)) \quad (40)$$

**Theorem 1**

$$\begin{aligned} & \forall X0.(v1\_xreal\_0 X0) \Rightarrow (\forall X1.(v7\_ordinal1 X1) \Rightarrow (\forall X2. \\ & (v7\_ordinal1 X2) \Rightarrow (\forall X3.(v7\_ordinal1 X3) \Rightarrow (\forall X4.( \\ & m1\_subset\_1 X4 (u1\_struct\_0 (k15\_euclid X3))) \Rightarrow (((r1\_xxreal\_0 \\ & np\_1 X1) \wedge (r1\_xxreal\_0 X2 X3)) \Rightarrow ((r1\_xxreal\_0 X2 X1) \vee (k1\_seq\_1 \\ & (k3\_funct\_2 (u1\_struct\_0 (k15\_euclid X3)) (u1\_struct\_0 (k15\_euclid \\ & X3)) (k3\_matrtop1 X3 X3 (k2\_matrtop3 X3 X0 X1 X2)) X4) X1 = k7\_real\_1 \\ & (k8\_real\_1 (k1\_seq\_1 X4 X1) (k20\_sin\_cos X0)) (k8\_real\_1 (k1\_seq\_1 \\ & X4 X2) (k4\_xcmplx\_0 (k17\_sin\_cos X0)))))))))) \end{aligned}$$