

## t11\_catalan2

(TMcC2UwmKP6LFYGABoamJrL7sCdQze9r7Tp)

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Let  $v7\_ordinal1 : \iota \Rightarrow o$  be given. Let  $v5\_ordinal1 : \iota \Rightarrow o$  be given. Let  $v1\_relat\_1 : \iota \Rightarrow o$  be given. Let  $v5\_relat\_1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k5\_numbers : \iota$  be given. Let  $v1\_funct\_1 : \iota \Rightarrow o$  be given. Let  $v1\_finset\_1 : \iota \Rightarrow o$  be given. Let  $v1\_catalan2 : \iota \Rightarrow o$  be given. Let  $k24\_binop\_2 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $np\_2 : \iota$  be given. Let  $k7\_afinsq\_2 : \iota \Rightarrow \iota$  be given. Let  $k5\_relat\_1 : \iota \Rightarrow \iota \Rightarrow \iota$  be given. Let  $r1\_xxreal\_0 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_afinsq\_1 : \iota \Rightarrow \iota$  be given. Let  $r1\_ordinal1 : \iota \Rightarrow \iota \Rightarrow o$  be given. Let  $k1\_card\_1 : \iota \Rightarrow \iota$  be given. Let  $k9\_xtuple\_0 : \iota \Rightarrow \iota$  be given. Let  $v3\_ordinal1 : \iota \Rightarrow o$  be given. Assume the following.

$$\begin{aligned} \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge (( \\ v5\_ordinal1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finset\_1 X1)))) \Rightarrow ((r1\_xxreal\_0 \\ X0 (k1\_afinsq\_1 X1)) \Rightarrow (k1\_afinsq\_1 (k5\_relat\_1 X1 X0) = X0))) \end{aligned} \quad (1)$$

Assume the following.

$$\begin{aligned} \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.((v1\_relat\_1 X1) \wedge (( \\ v5\_ordinal1 X1) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finset\_1 X1)))) \Rightarrow ((r1\_xxreal\_0 \\ (k1\_afinsq\_1 X1) X0) \Rightarrow (k5\_relat\_1 X1 X0 = X1))) \end{aligned} \quad (2)$$

Assume the following.

$$\forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.(v7\_ordinal1 X1) \Rightarrow (( \\ r1\_xxreal\_0 X0 X1) \Leftrightarrow (r1\_ordinal1 X0 X1))) \quad (3)$$

Assume the following.

$$\begin{aligned} \forall X0.(v7\_ordinal1 X0) \Rightarrow (\forall X1.((v5\_ordinal1 X1) \wedge ( \\ (v1\_relat\_1 X1) \wedge ((v5\_relat\_1 X1 k5\_numbers) \wedge ((v1\_funct\_1 X1) \wedge \\ (v1\_finset\_1 X1)))) \Rightarrow ((v1\_catalan2 X1) \Rightarrow (r1\_xxreal\_0 (k24\_binop\_2 \\ np\_2 (k7\_afinsq\_2 (k5\_relat\_1 X1 X0))) X0))) \end{aligned} \quad (4)$$

Assume the following.

$$\forall X0.((v1\_relat\_1 X0) \wedge ((v5\_ordinal1 X0) \wedge ((v1\_funct\_1 \\ X0) \wedge (v1\_finset\_1 X0)))) \Rightarrow (k1\_afinsq\_1 X0 = k1\_card\_1 X0) \quad (5)$$

Assume the following.

$$\forall X0.((v1\_relat\_1 X0) \wedge ((v5\_ordinal1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finset\_1 X0)))) \Rightarrow (k1\_card\_1 X0 = k9\_xtuple\_0 X0) \quad (6)$$

Assume the following.

$$\forall X0.((v1\_relat\_1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v5\_ordinal1 X0))) \Rightarrow (v3\_ordinal1 (k9\_xtuple\_0 X0)) \quad (7)$$

Assume the following.

$$\forall X0.((v1\_relat\_1 X0) \wedge ((v5\_ordinal1 X0) \wedge ((v1\_funct\_1 X0) \wedge (v1\_finset\_1 X0)))) \Rightarrow (v7\_ordinal1 (k9\_xtuple\_0 X0)) \quad (8)$$

Assume the following.

$$\forall X0. \forall X1. ((v3\_ordinal1 X0) \wedge (v3\_ordinal1 X1)) \Rightarrow ((r1\_ordinal1 X0 X1) \vee (r1\_ordinal1 X1 X0)) \quad (9)$$

Assume the following.

$$\forall X0. (v7\_ordinal1 X0) \Rightarrow (v3\_ordinal1 X0) \quad (10)$$

**Theorem 1**

$$\forall X0. (v7\_ordinal1 X0) \Rightarrow (\forall X1. ((v5\_ordinal1 X1) \wedge ((v1\_relat\_1 X1) \wedge ((v5\_relat\_1 X1 k5\_numbers) \wedge ((v1\_funct\_1 X1) \wedge (v1\_finset\_1 X1))))) \Rightarrow (((v1\_catalan2 X1) \wedge (k24\_binop\_2 np\_2 (k7\_afinsq\_2 (k5\_relat\_1 X1 X0)) = X0)) \Rightarrow ((r1\_xxreal\_0 X0 (k1\_afinsq\_1 X1)) \wedge (k1\_afinsq\_1 (k5\_relat\_1 X1 X0) = X0))))$$