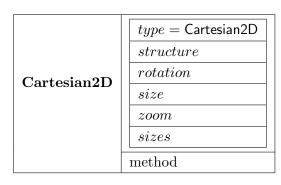
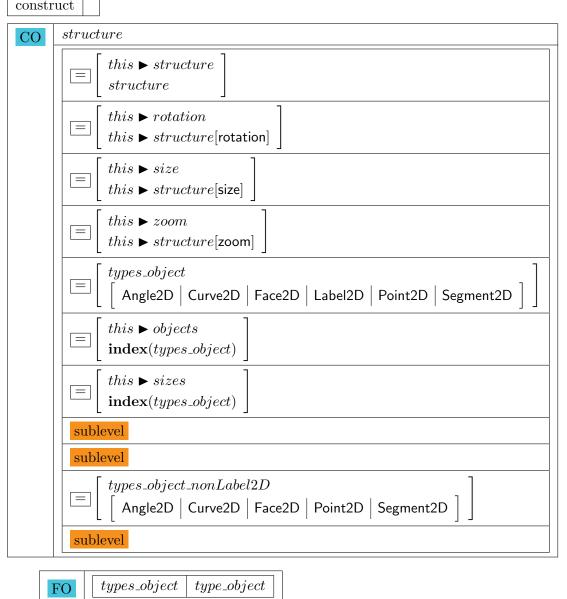
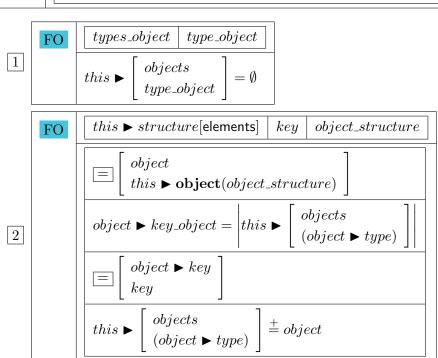
1 Defnition



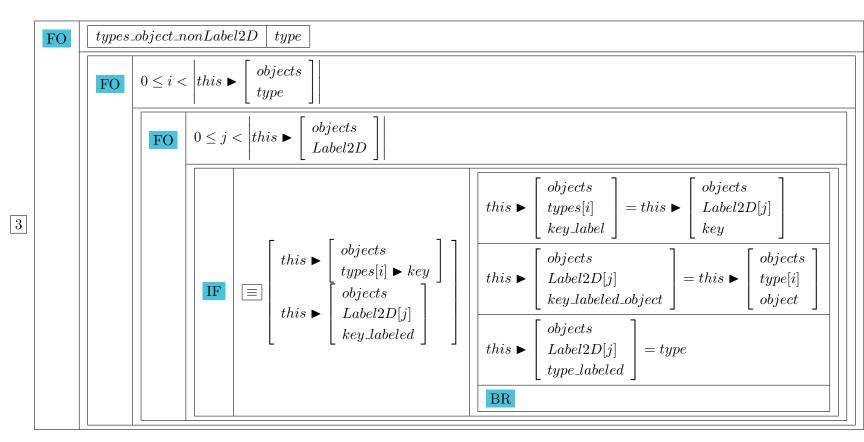
2 Method

1. construct

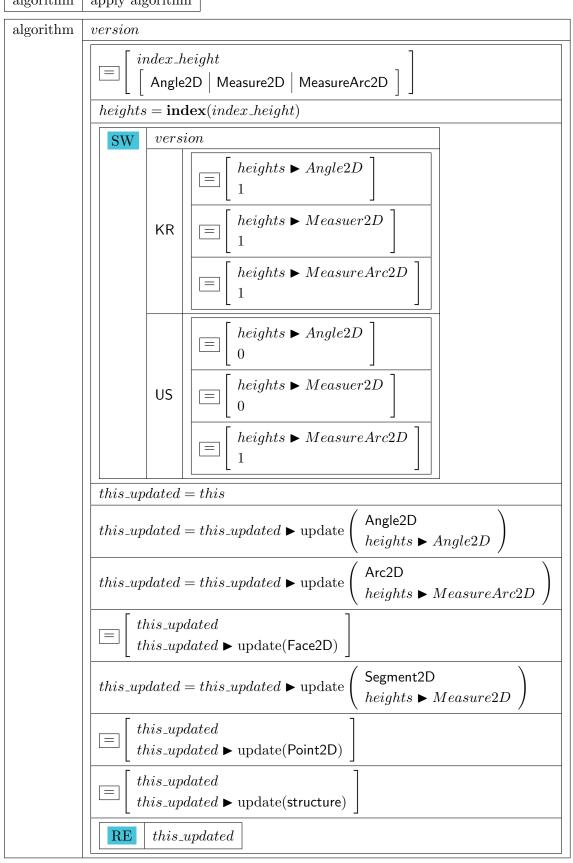




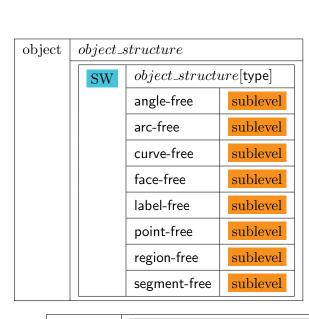
New Sinod - Cartesian2D



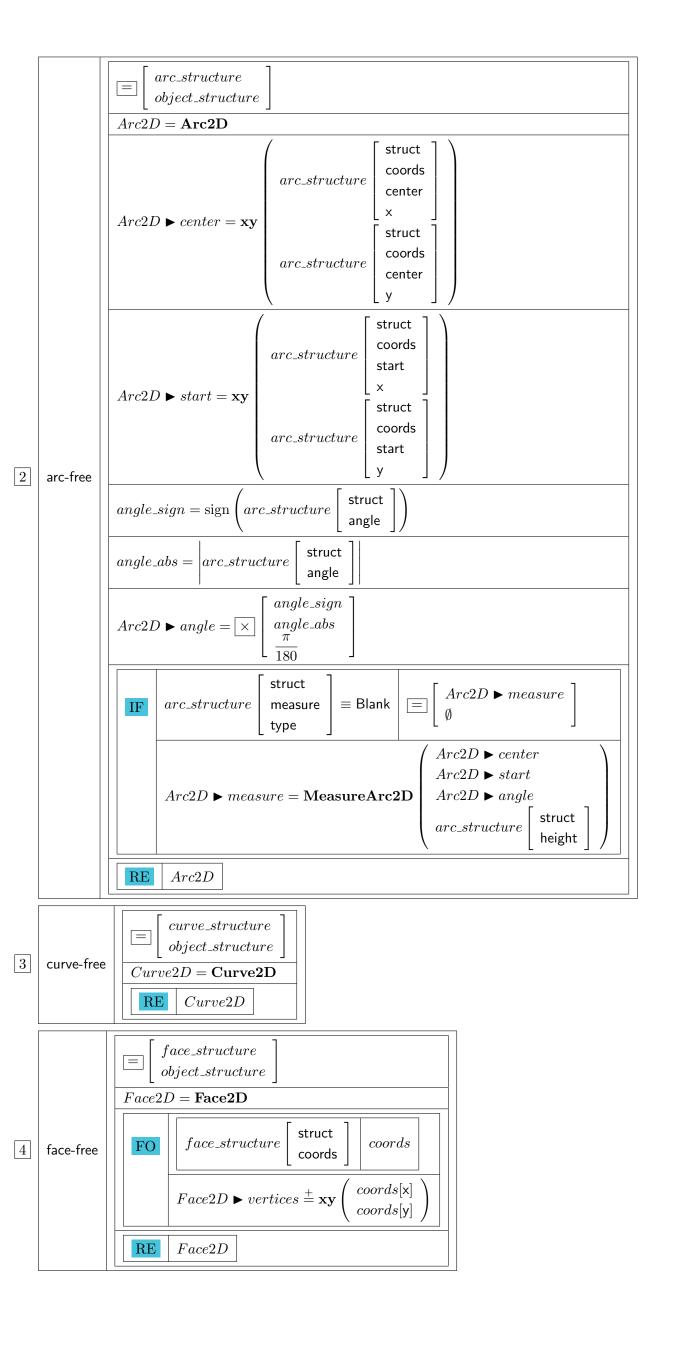
2. algorithm apply algorithm

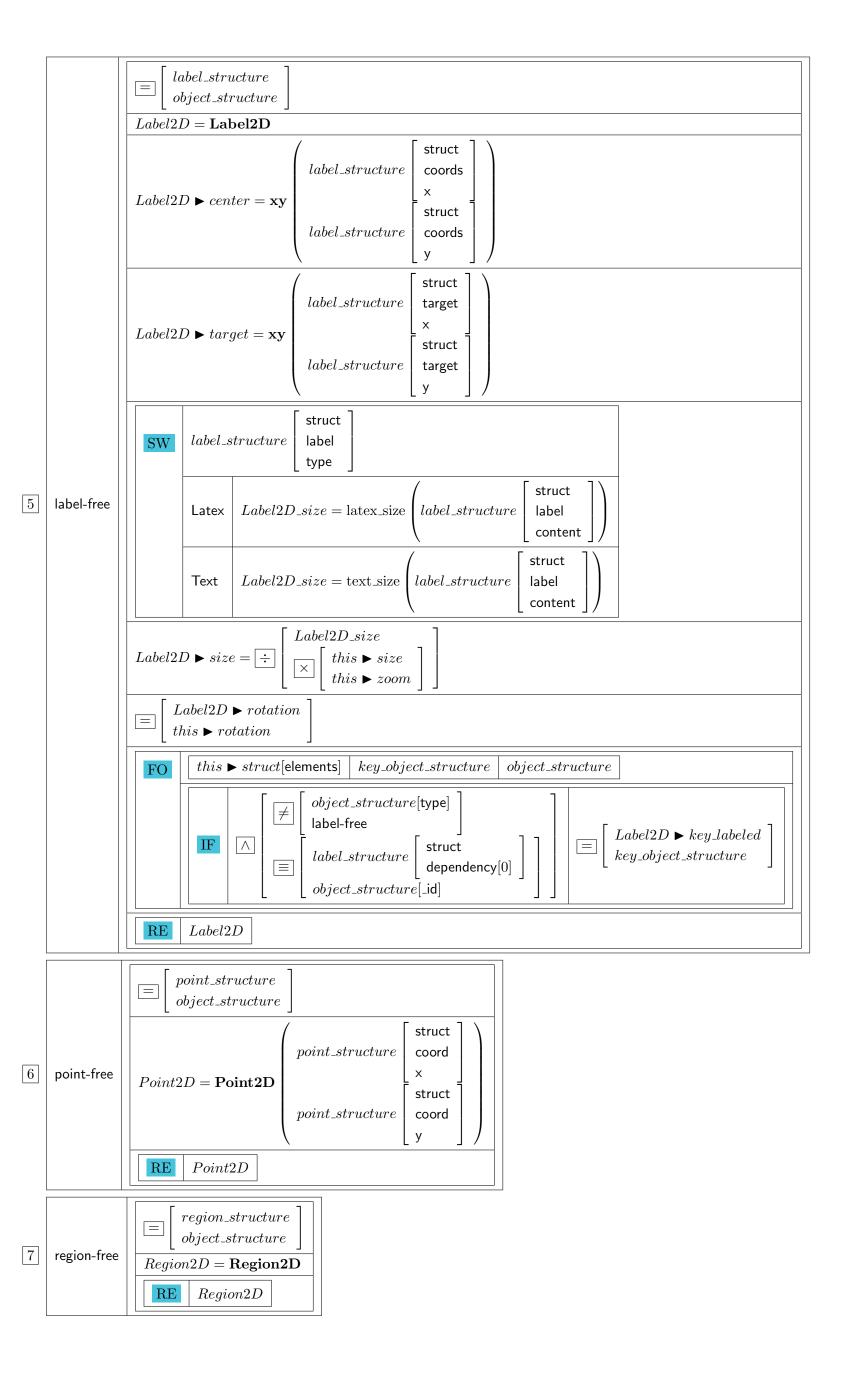


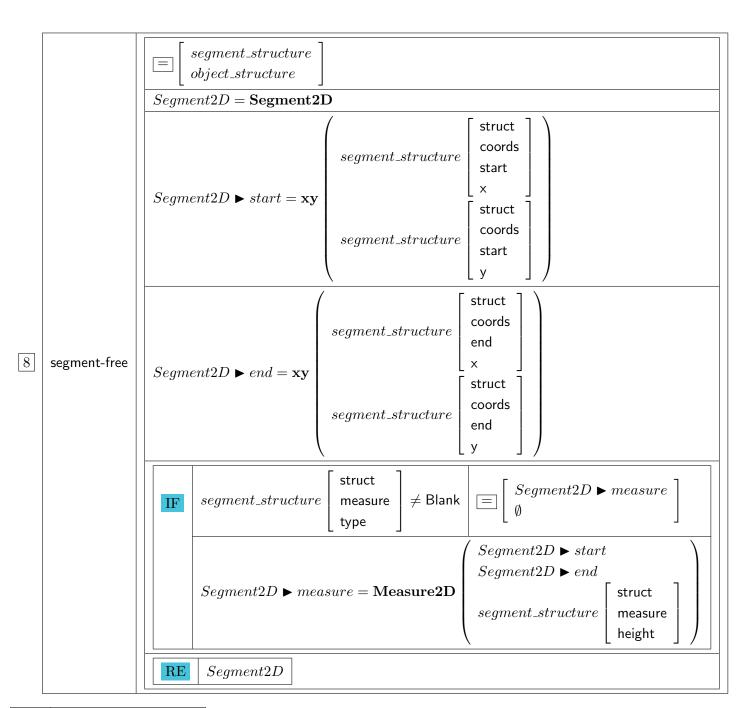
3. object convert object_structure to object



		$ \equiv \left[\begin{array}{c} angle_structure \\ object_structure \end{array} \right] $				
		$Angle 2D = \mathbf{Angle 2D}$				
	angle-free	angle_structure struct coords center x				
		$Angle2D ightharpoonup center = \mathbf{xy}$ $angle_structure \begin{bmatrix} struct \\ coords \\ center \\ y \end{bmatrix}$				
		$angle_structure \begin{bmatrix} struct \\ coords \\ start \\ x \end{bmatrix}$ $Angle2D \triangleright start = \mathbf{x}\mathbf{y}$				
		angle_structure struct coords start y				
		$Angle 2D \blacktriangleright end = \mathbf{xy} \begin{pmatrix} angle_structure \begin{bmatrix} struct \\ coords \\ end \\ x \end{bmatrix}$				
		$angle_structure \begin{bmatrix} struct \\ coords \\ end \\ y \end{bmatrix}$				
		$Angle2D \blacktriangleright height = angle_structure \left[\begin{array}{c} \text{struct} \\ \text{style} \\ \text{height} \end{array} \right]$				
		$Angle 2D \blacktriangleright right = angle_structure \left[\begin{array}{c} struct \\ style \\ rightAngle \end{array} \right]$				
		RE Angle2D				

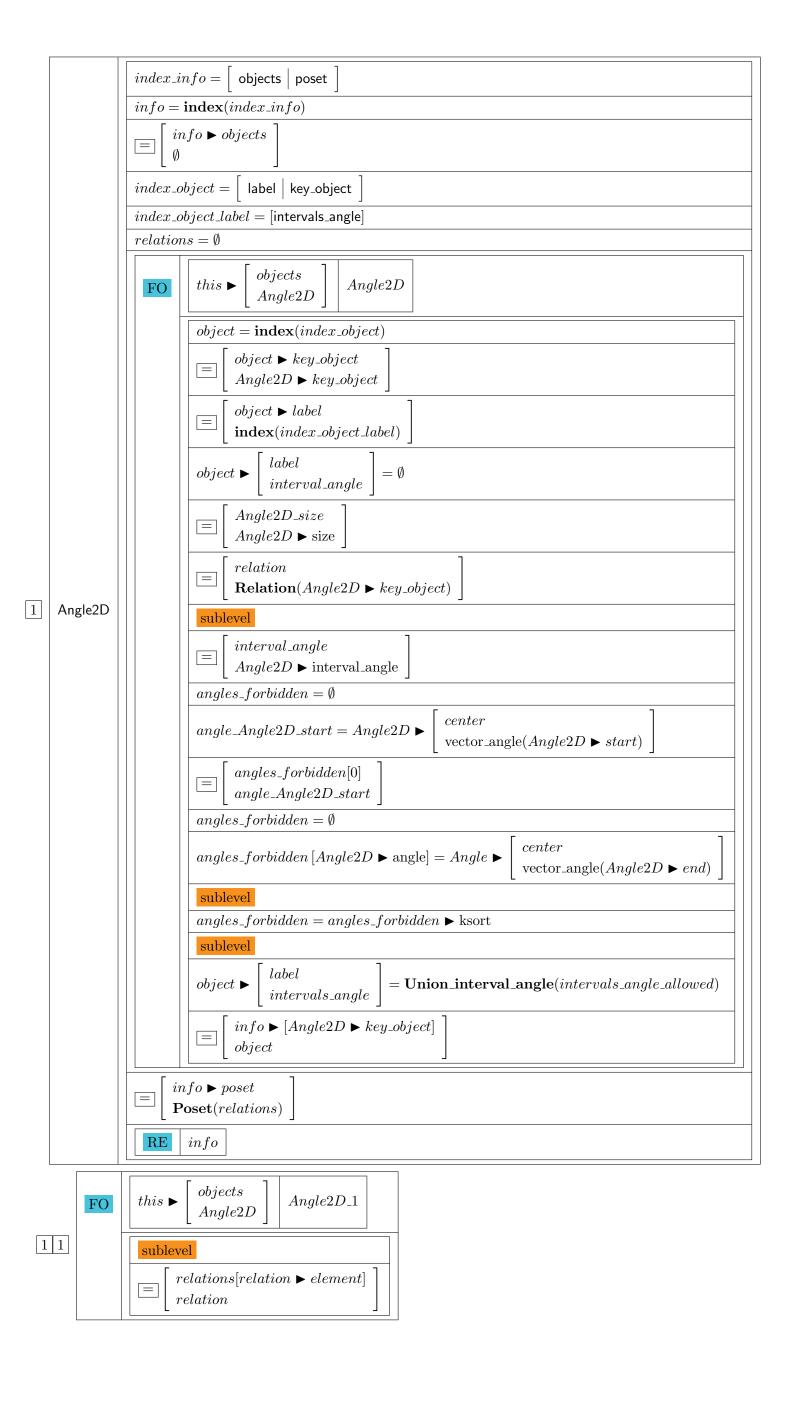






4. info imformation of object

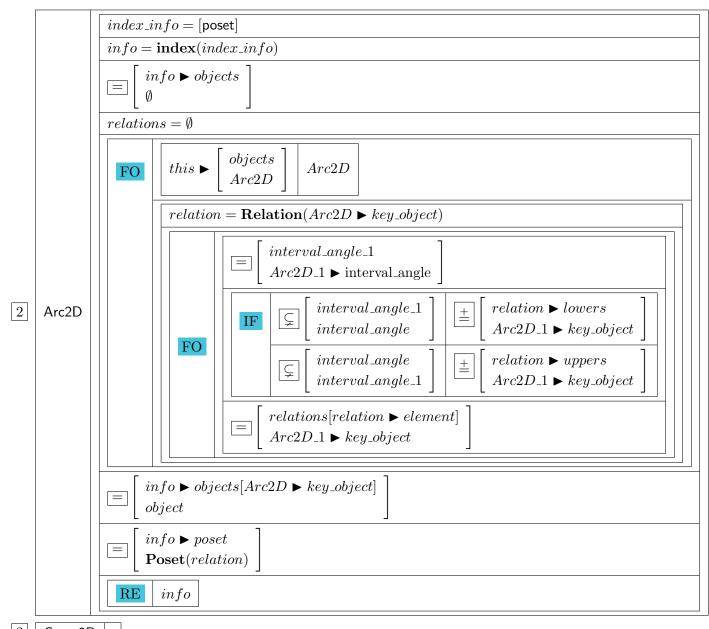
	info	type		
		SW	type	
			Angle2D	sublevel
			Arc2D	sublevel
			Curve2D	sublevel
			Point2D	sublevel
			Segment2D	sublevel
Į		_	<u> </u>	



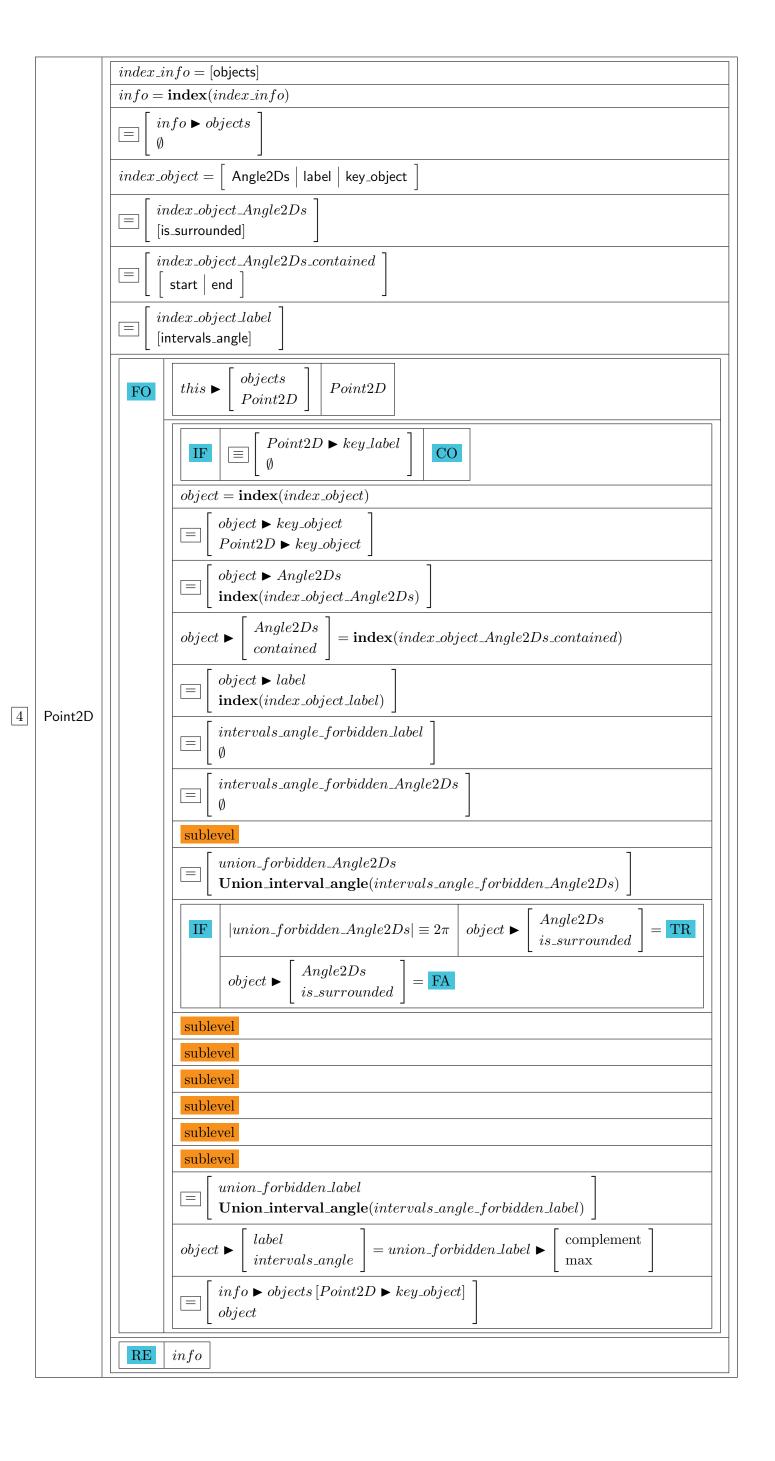


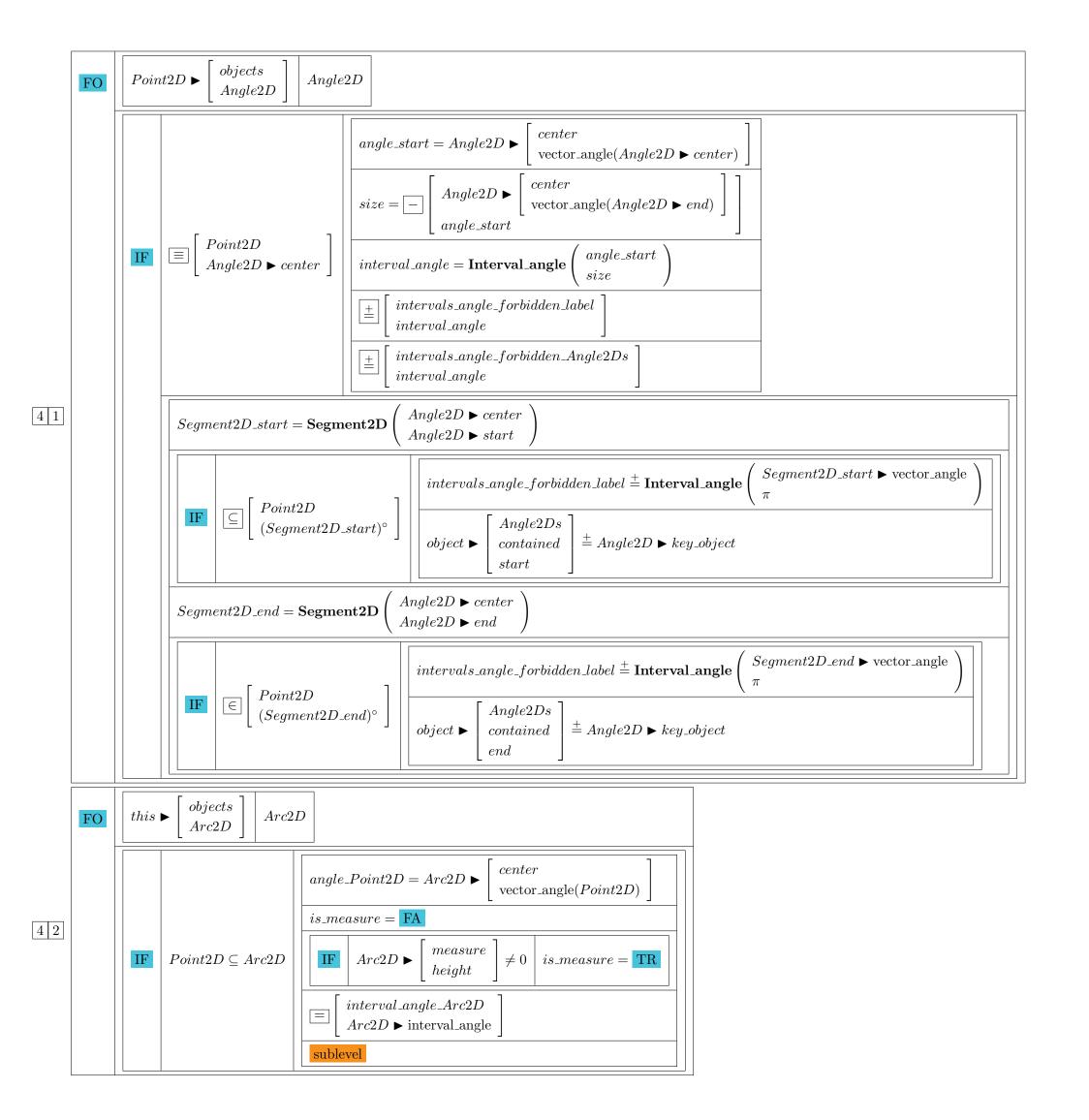
11	1 IF	$ \neq \begin{bmatrix} Angle 2D 1 \triangleright key_object \\ Angle 2D \triangleright key_object \end{bmatrix} $		
	FO	$ \begin{array}{ c c c c c }\hline this \blacktriangleright \left[\begin{array}{c} objects \\ Segment2D \end{array} \right] & Segment2D \end{array} $		
	•			
1 2			$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	
			$angle_Segment2D_end = Angle2D \blacktriangleright \left[\begin{array}{c} center \\ vector_angle(Segment2D \blacktriangleright end) \end{array} \right]$	
			$ \boxed{ \textbf{IF} } \boxed{ \in \left[\begin{array}{c} angle_Segment2D_end \\ (interval_angle)^{\circ} \end{array} \right] } angles_forbidden \\ \boxed{ \left[- \left[\begin{array}{c} angle_Segment2D_end \\ angle_Angle2D_start \end{array} \right] \right] } = angle_Segment2D_end \\ \boxed{ angle_Segment2D_end } \\ \end{aligned} $	
	FO	$0 \le i < angles_forbidden $		
	10		$\begin{picture}(10,0) \put(0,0){\line(0,0){100}} \put(0,0){\line(0,0){100$	
1 3	$\int in x$	$intervals_angle_allowed \stackrel{+}{=} \mathbf{Interval_angle}$	$igsim igsim egin{bmatrix} angles_forbidden[i+1] \ angles_forbidden[i] \end{bmatrix} igg)$	

8			

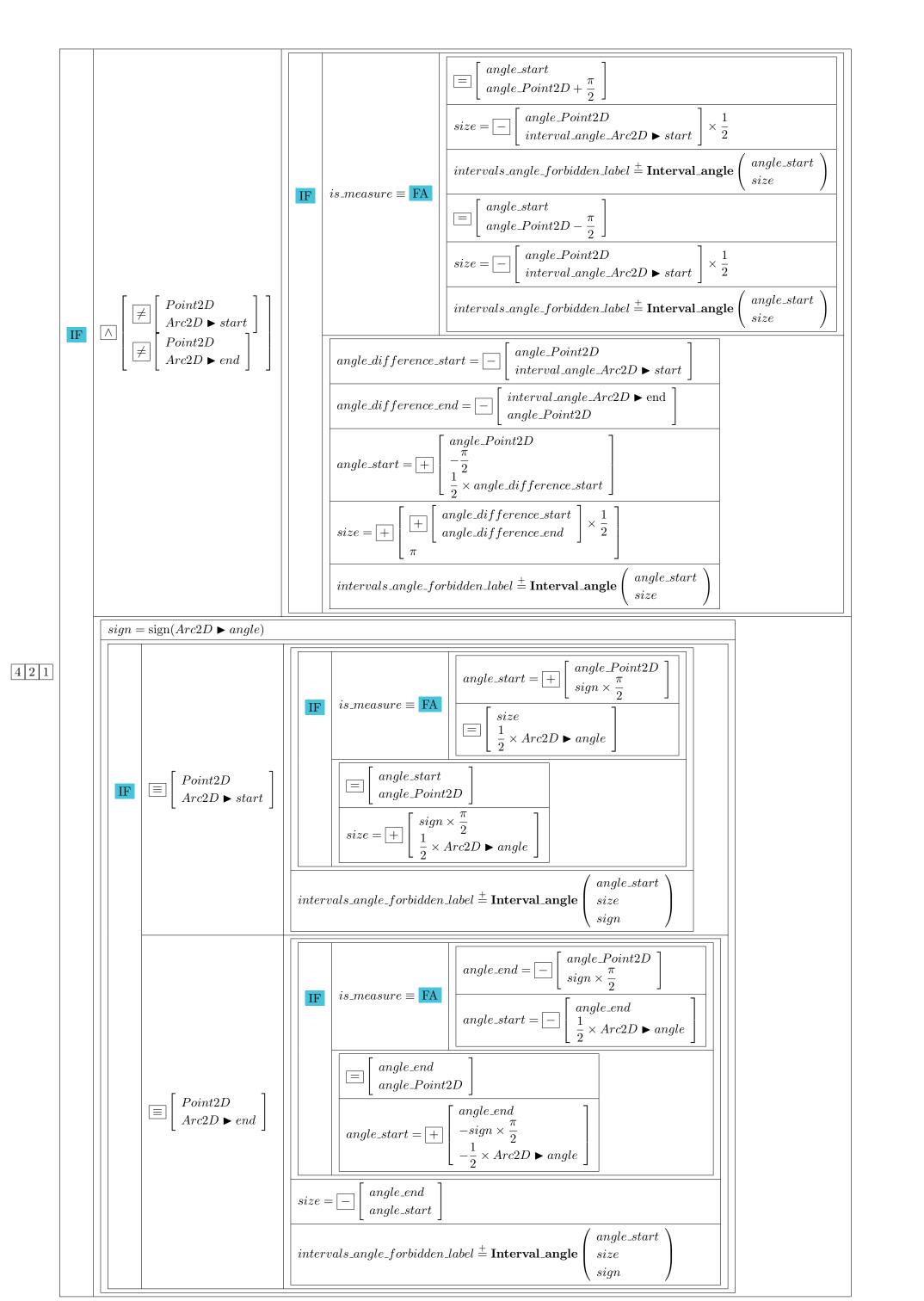


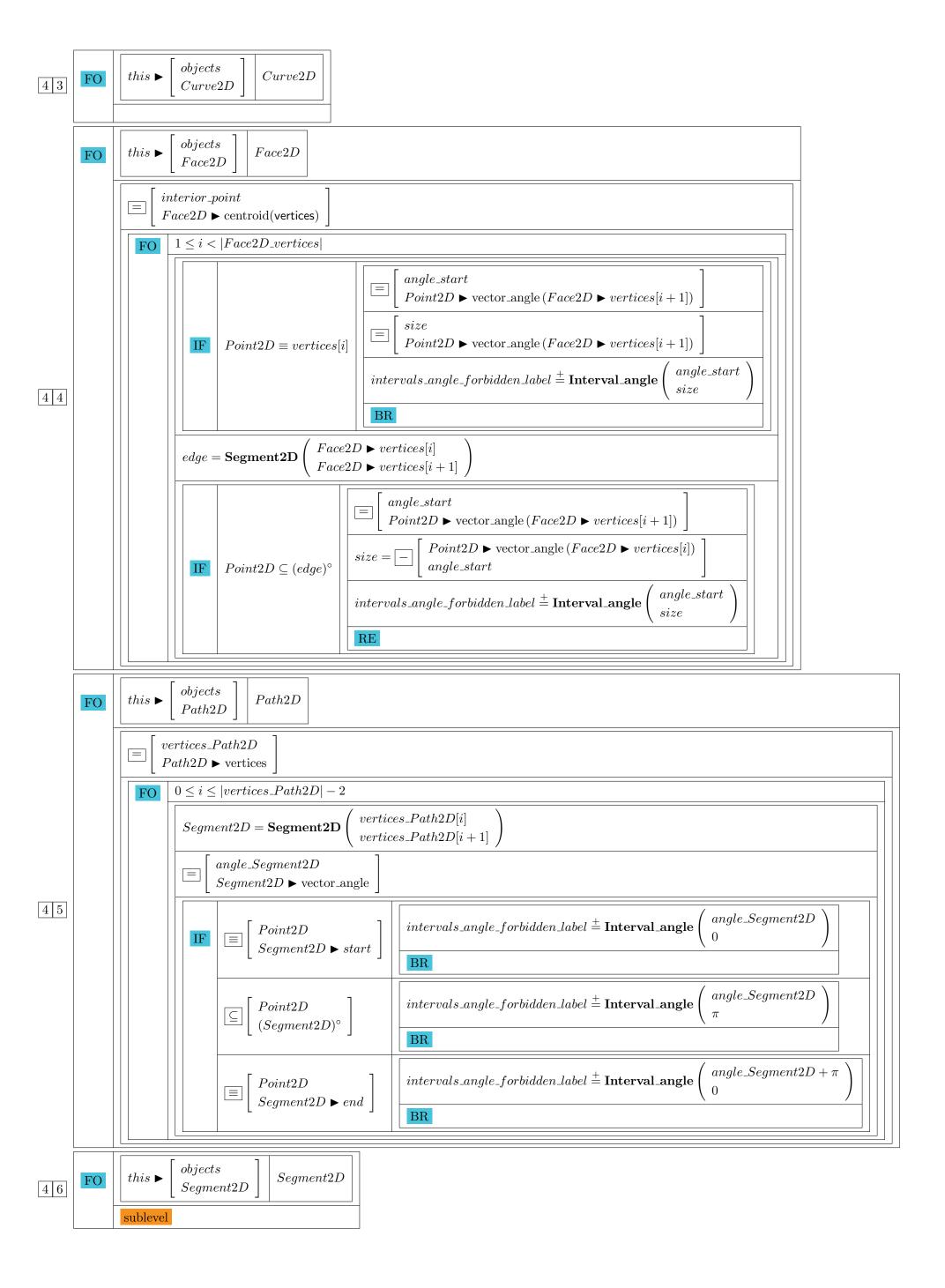
3 Curve2D



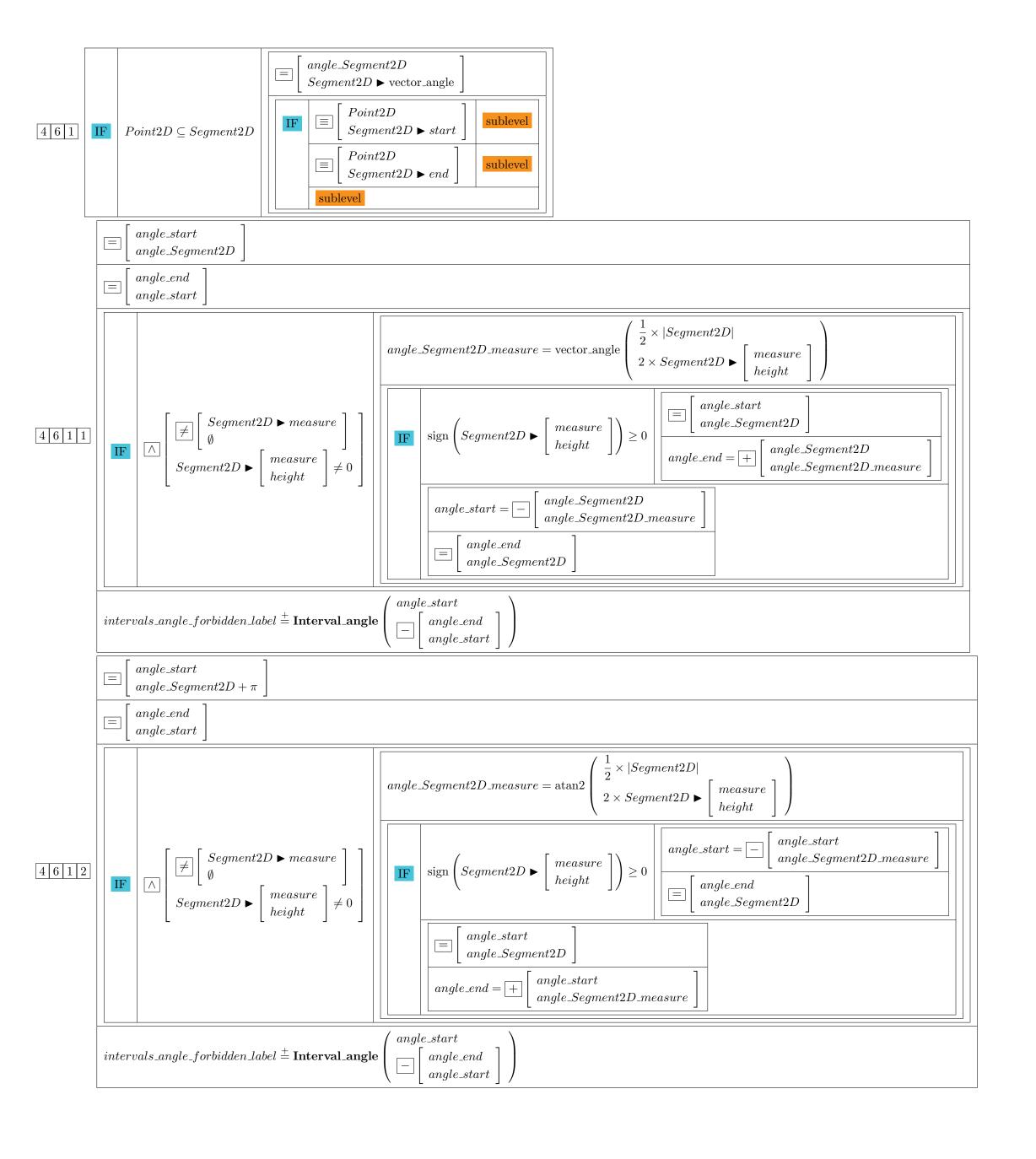




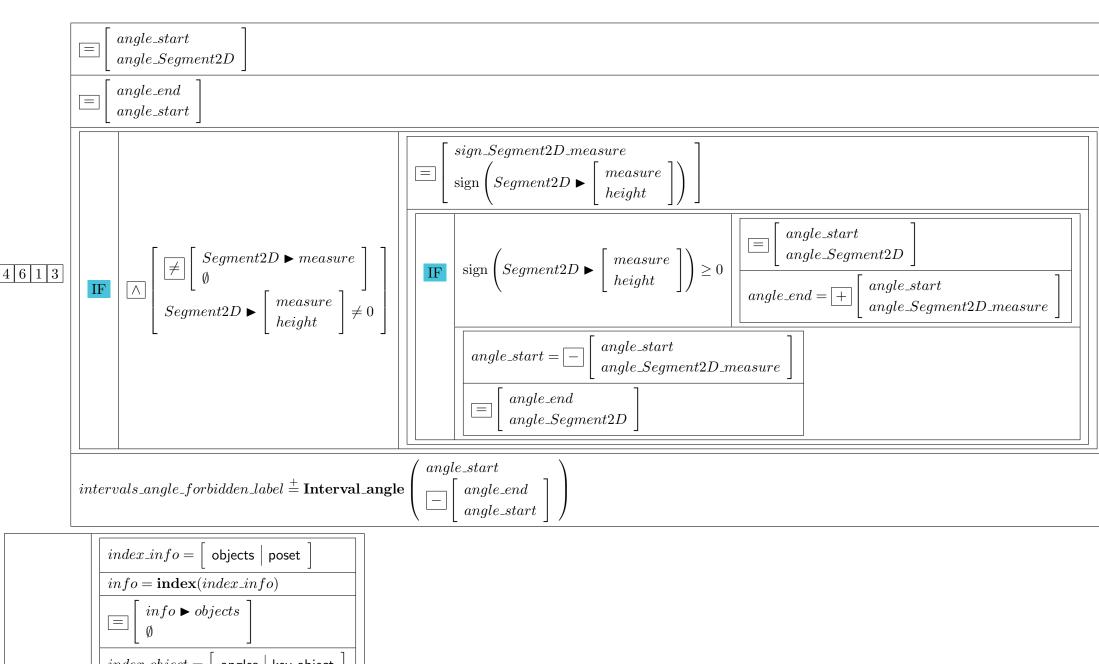






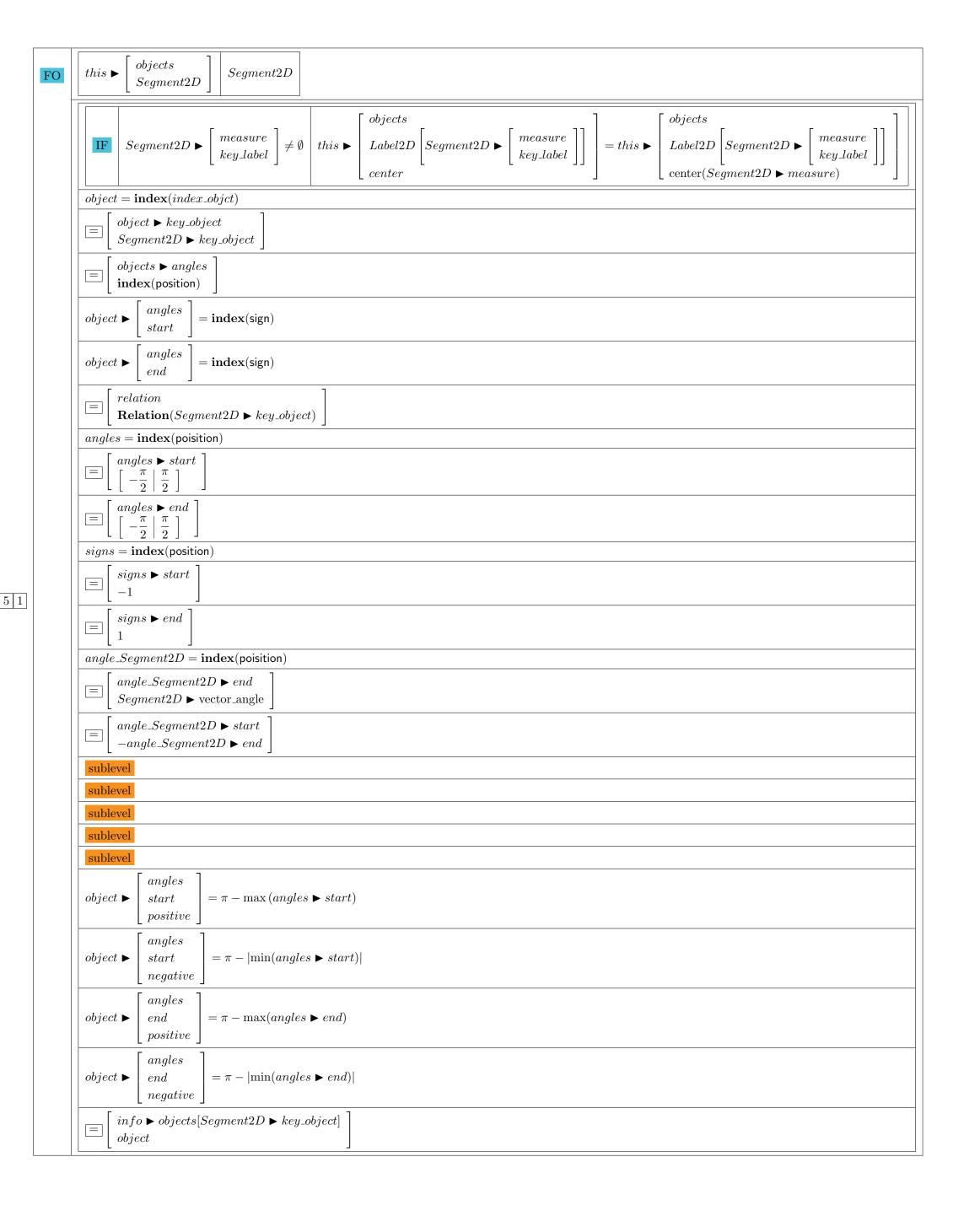




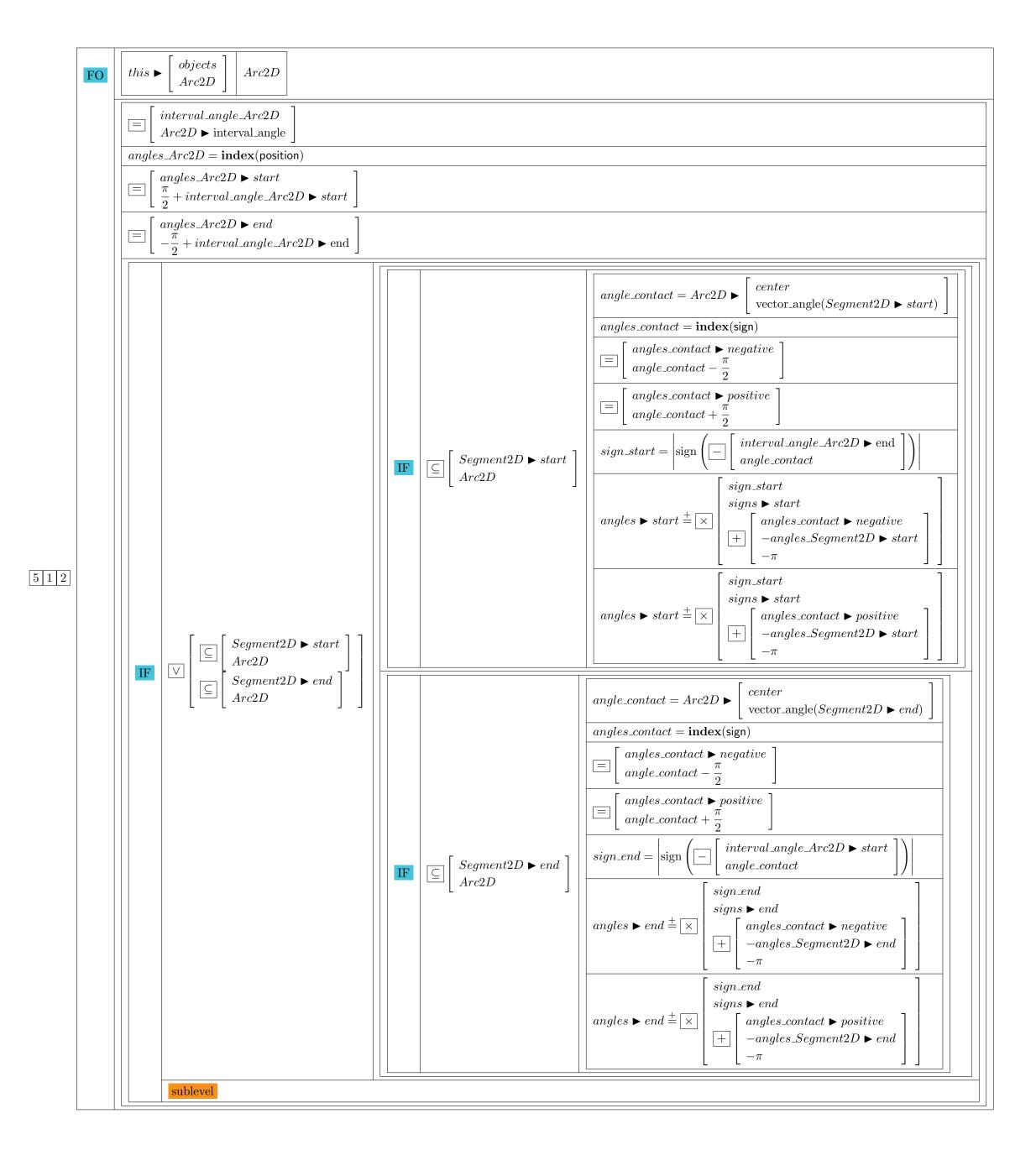


 $[index_info = [objects | poset]]$ $info = index(index_info)$ $[info \blacktriangleright objects]$ $index_object = [angles | key_object]$ $relations = \emptyset$ [sublevel] $[info \blacktriangleright poset]$ $[mfo \blacktriangleright poset]$ [Poset(relations)] [RE] info



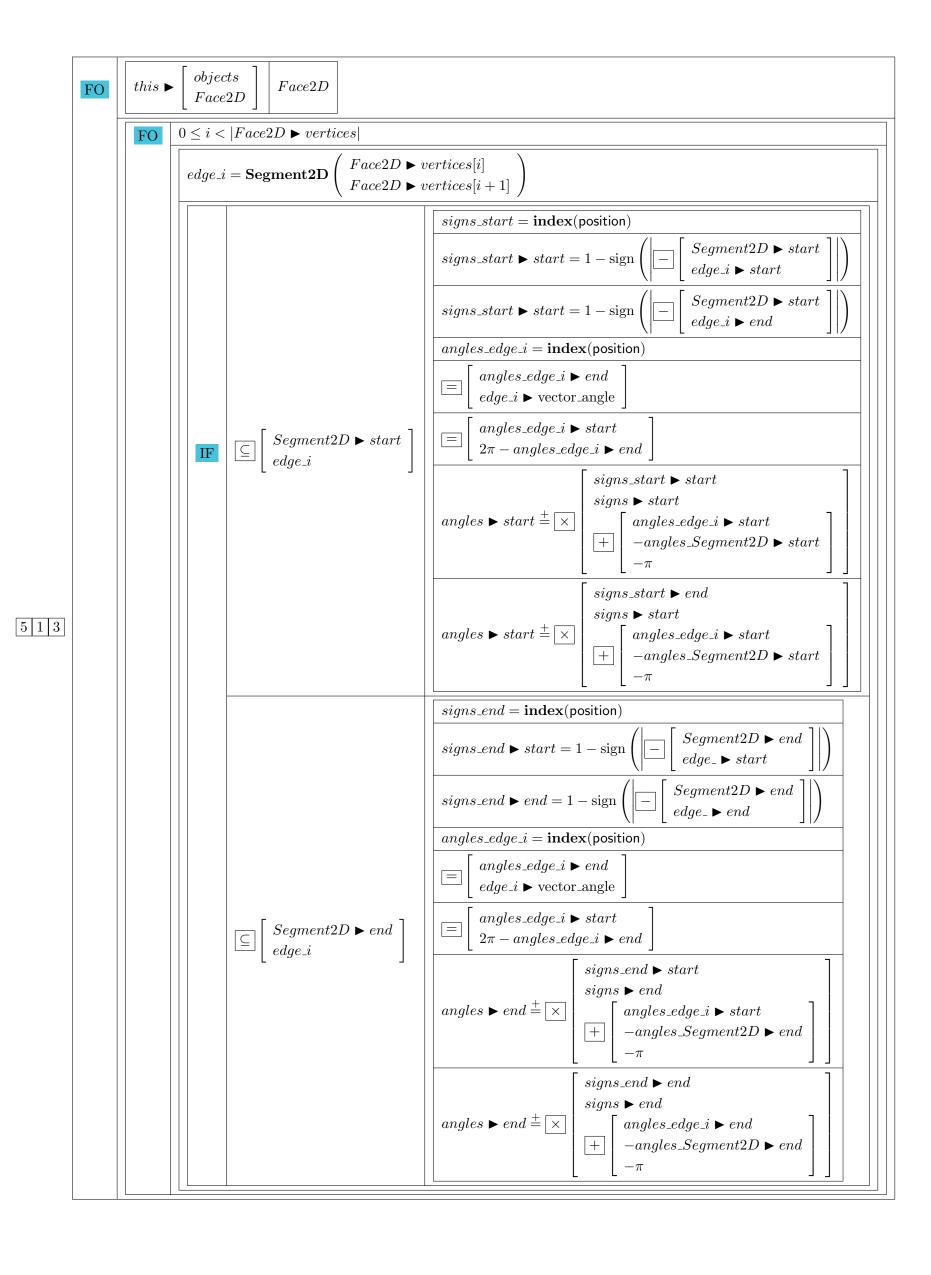


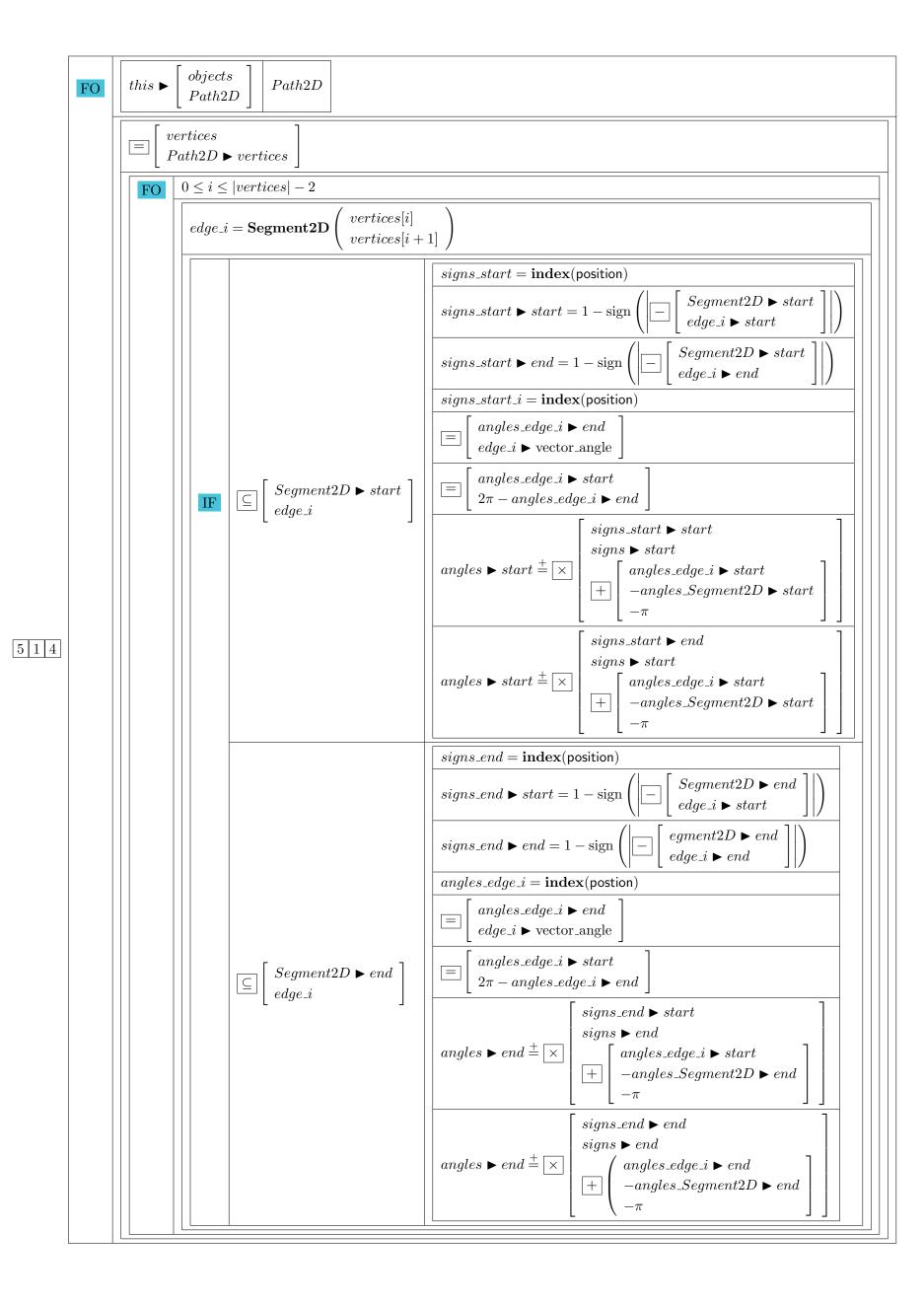
	FO	this	$ \begin{array}{ c c c c c } \hline \bullet & objects \\ Angle 2D \\ \hline \end{array} Angle 2D \\ \hline \end{array}$	
				$angles_Angle2D = \mathbf{index}(position)$
				$angles_Angle2D \blacktriangleright start = Angle2D \blacktriangleright \begin{bmatrix} center \\ vector_angle(Angle2D \blacktriangleright start) \end{bmatrix}$
				$angles_Angle2D \blacktriangleright end = Angle2D \blacktriangleright \begin{bmatrix} center \\ vector_angle(Angle2D \blacktriangleright end) \end{bmatrix}$
				parities = index(position)
				$parities \blacktriangleright start = sign \left(\left \boxed{-} \left[\begin{array}{c} Angle2D \blacktriangleright center \\ Segment2D \blacktriangleright start \end{array} \right] \right \right)$
				$parities \blacktriangleright end = \text{sign} \left(\left \boxed{-} \left[\begin{array}{c} Angle2D \blacktriangleright center \\ Segment2D \blacktriangleright end \end{array} \right] \right \right)$
				$angles_start = \mathbf{index}(position)$
				$angles_start \blacktriangleright start = \left[\times \begin{bmatrix} signs \blacktriangleright start \\ -angles_Angle2D \blacktriangleright start \\ -angles_Segment2D \blacktriangleright start \\ -\pi \end{bmatrix} \right]$
				$angles_start \blacktriangleright end = \boxed{\times} \begin{bmatrix} signs \blacktriangleright start \\ -angles_Angle2D \blacktriangleright end \\ -angles_Segment2D \blacktriangleright start \\ -\pi \end{bmatrix}$
		IF		$angles_end = \mathbf{index}(position)$
5 1 1				$angles_end \blacktriangleright start = \left[\times \begin{bmatrix} signs \blacktriangleright end \\ angles_Angle2D \blacktriangleright start \\ -angles_Segment2D \blacktriangleright end \\ -\pi \end{bmatrix} \right]$
				$angles_end \blacktriangleright end = \left[\times \begin{bmatrix} signs \blacktriangleright end \\ = angles_Angle2D \blacktriangleright end \\ -angles_Segment2D \blacktriangleright end \\ -\pi \end{bmatrix} \right]$
				$angles \triangleright start \stackrel{+}{=} + \left[\begin{array}{ c c c c } \hline \times & parities \triangleright start \\ angles_start \triangleright start \\ \hline \times & 1 - parities \triangleright start \\ \hline \pi \times \operatorname{sign}(angles_start \triangleright start) \end{array} \right]$
				$angles \blacktriangleright start \stackrel{+}{=} + \left[\begin{array}{ c c c c c } \hline \times & parities \blacktriangleright start \\ angles_start \blacktriangleright end \\ \hline & 1 - parities \blacktriangleright start \\ \hline & \pi \times \operatorname{sign}(angles_start \blacktriangleright end) \end{array} \right]$
				$angles \blacktriangleright end \stackrel{+}{=} + \left[\begin{array}{c} \times \\ \times \\ \times \\ \times \end{array} \right] \begin{bmatrix} parities \blacktriangleright end \\ angles_start \blacktriangleright start \\ 1 - parities \blacktriangleright end \\ \pi \times \text{sign}(angles_start \blacktriangleright start) \end{array} \right]$
				$angles \blacktriangleright end \stackrel{+}{=} + \left[\begin{array}{c} \times \\ \times \\ - \end{array} \begin{bmatrix} parities \blacktriangleright end \\ angles_start \blacktriangleright end \\ 1 - parities \blacktriangleright end \\ \pi \times \operatorname{sign}(angles_start \blacktriangleright end) \end{array} \right]$



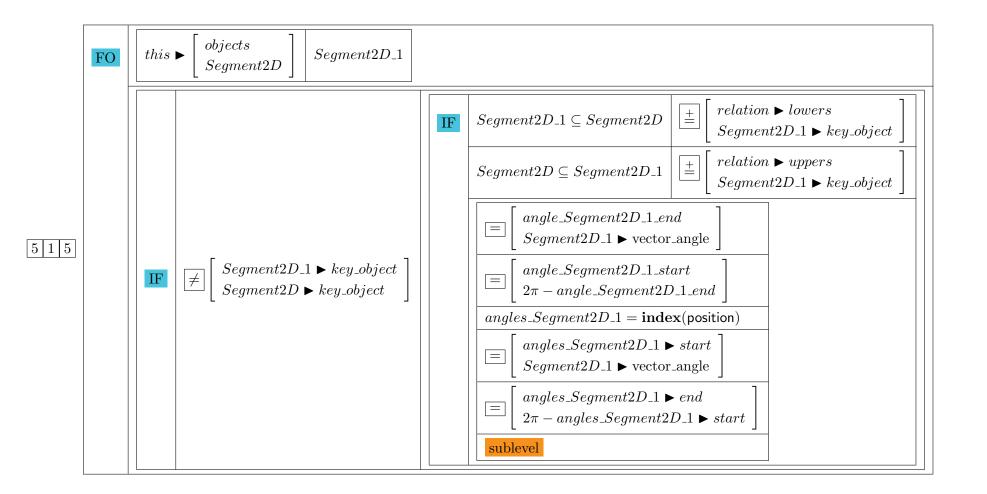
		$ \boxed{ \boxed{ \begin{bmatrix} Arc2D \blacktriangleright start \\ Segment2D \\ Arc2D \blacktriangleright end \\ Segment2D \end{bmatrix} } $	$ \boxed{ \textbf{IF} \boxed{ \begin{bmatrix} Arc2D \blacktriangleright start \\ Segment2D \end{bmatrix} } \boxed{ angles \blacktriangleright start \stackrel{+}{=} \pi \times \text{sign} \left(\begin{array}{c} signs \blacktriangleright start \\ \times \\ -angles_Arc2D \blacktriangleright start \\ -\pi \end{array} \right) } \\ angles \blacktriangleright end \stackrel{+}{=} \pi \times \text{sign} \left(\begin{array}{c} signs \blacktriangleright end \\ \times \\ -\pi \end{array} \right) \\ \boxed{ \begin{bmatrix} signs \blacktriangleright end \\ -angles_Arc2D \blacktriangleright start \\ -angles_Segment2D \blacktriangleright end \\ -\pi \end{bmatrix} 1 \\ -\pi \end{bmatrix} } $
5 1 2 1			$ IF \subseteq \begin{bmatrix} Arc2D \blacktriangleright end \\ Segment2D \end{bmatrix} $
		$Arc2D ightharpoonup is_tangent(Segment2D)$	







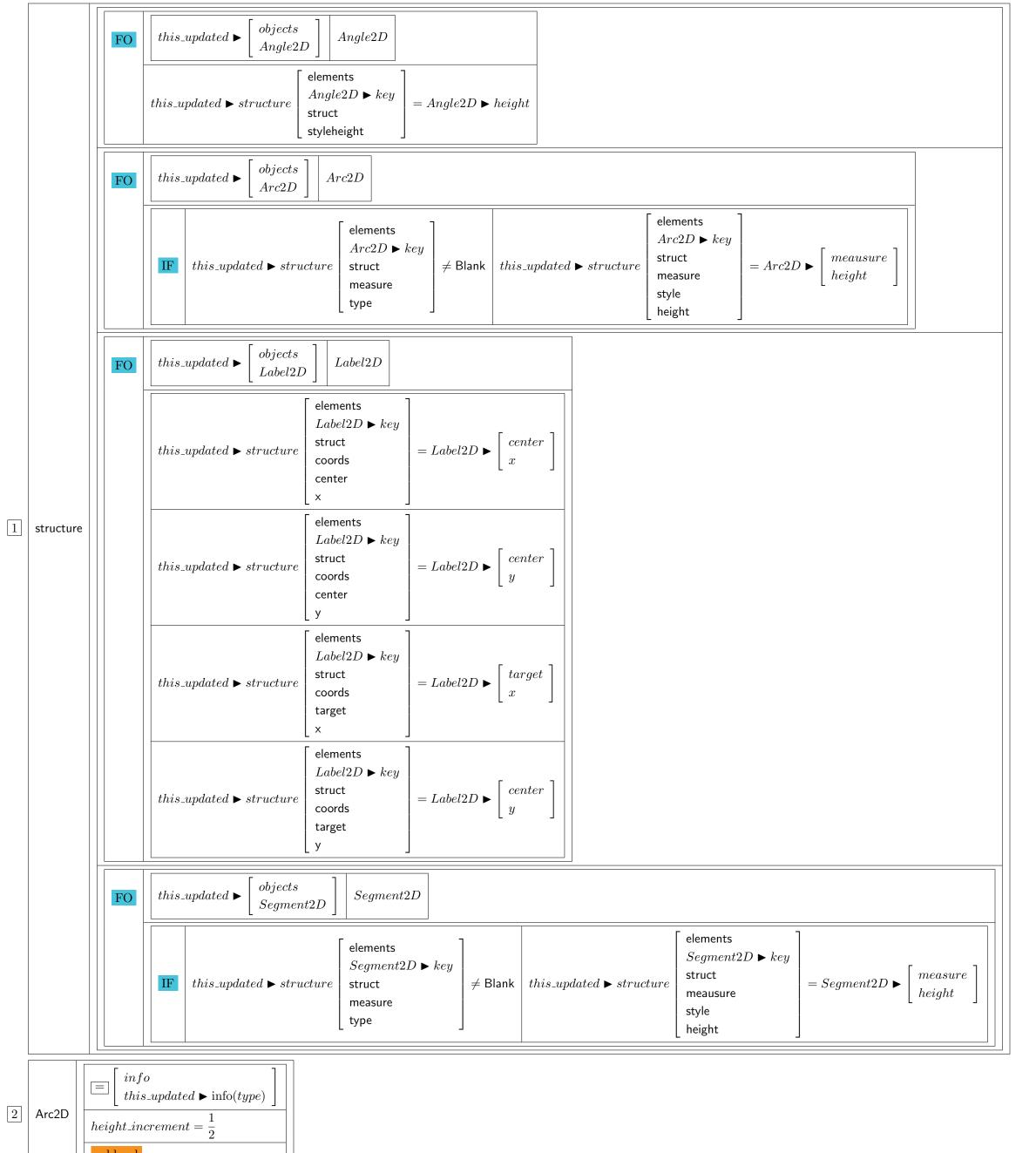
L

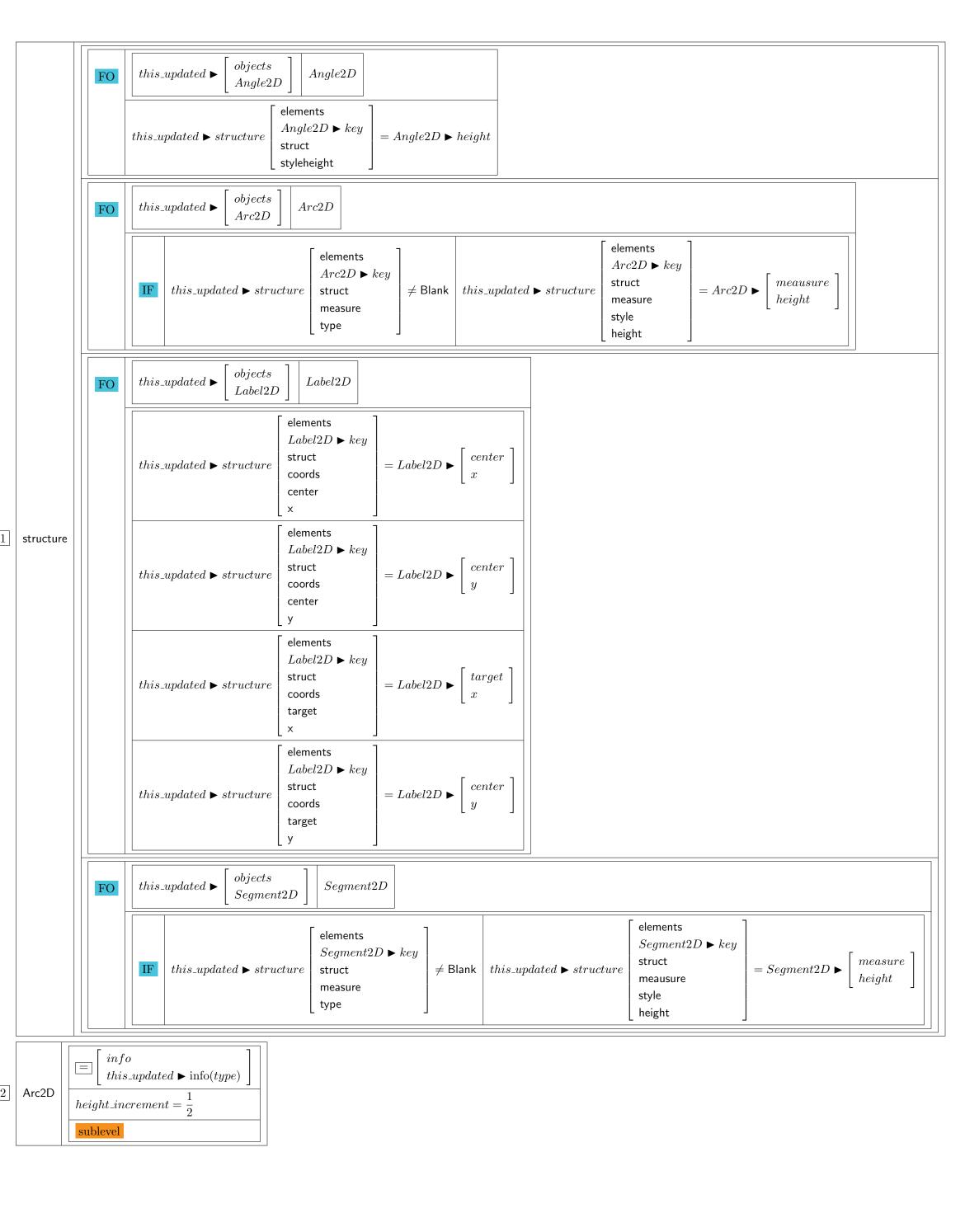


			$signs_start = \mathbf{index}(position)$		
			$signs_start = \mathbf{index}(position)$ $signs_start \blacktriangleright start = 1 - \mathrm{sign} \left(\left \boxed{- \left[\begin{array}{c} Segment2D \blacktriangleright start \\ Segment2D_1 \blacktriangleright end \end{array} \right] \right \right)}$		
		$ \in \left[\begin{array}{c} Segment2D \blacktriangleright start \\ Segment2D_1 \end{array} \right] $	$signs_start \triangleright end = 1 - sign \left(\left \boxed{- \left[\begin{array}{c} Segment2D \triangleright start \\ Segment2D_1 \triangleright start \end{array} \right] \right \right)}$		
	IF		$angles \blacktriangleright start \stackrel{+}{=} \times \begin{bmatrix} signs_start \blacktriangleright start \\ signs \blacktriangleright start \\ -angles_Segment2D_1 \blacktriangleright start \\ -\pi \end{bmatrix} \end{bmatrix}$		
			$angles \blacktriangleright start \stackrel{+}{=} \times \begin{bmatrix} signs_start \blacktriangleright end \\ signs \blacktriangleright start \\ = \begin{bmatrix} angles_Segment2D_1 \blacktriangleright end \\ -angles_Segment2D \blacktriangleright start \\ -\pi \end{bmatrix} \end{bmatrix}$		
			$signs_end = \mathbf{index}(position)$		
			$signs_end \blacktriangleright start = 1 - sign \left(\left \boxed{- \left[\begin{array}{c} Segment2D \blacktriangleright end \\ Segment2D_ \blacktriangleright end \end{array} \right] \right \right)}$		
			$signs_end \triangleright end = 1 - sign \left(\left \begin{array}{c} Segment2D \triangleright end \\ Segment2D_{-} \triangleright start \end{array} \right \right)$		
		$\subseteq \left[\begin{array}{c} Segment2D \blacktriangleright end \\ Segment2D_1 \end{array} \right]$	$angles \blacktriangleright end \stackrel{+}{=} \times \begin{bmatrix} sign_end \blacktriangleright start \\ signs \blacktriangleright end \\ \\ + \begin{bmatrix} angles_Segment2D_1 \blacktriangleright start \\ -angles_Segment2D \blacktriangleright end \\ -\pi \end{bmatrix} \end{bmatrix}$		
5 1 5 1			$angles \blacktriangleright end \stackrel{+}{=} \times \begin{bmatrix} sign_end \blacktriangleright end \\ signs \blacktriangleright end \\ \\ + \begin{bmatrix} angles_Segment2D_1 \blacktriangleright start \\ -angles_Segment2D \blacktriangleright end \\ -\pi \end{bmatrix} \end{bmatrix}$		
			$signs_end = \mathbf{index}(position)$		
			$signs_end \blacktriangleright start = sign \left(\begin{array}{c} = \\ -angles_Segment2D_1 \blacktriangleright end \\ -angles_Segment2D \blacktriangleright end \\ -\pi \end{array} \right] \right)$		
			$signs_end \blacktriangleright end = sign \left(\begin{array}{c} -angles_Segment2D_1 \blacktriangleright end \\ +angles_Segment2D \blacktriangleright start \\ +\pi \end{array} \right]$		
			$ \begin{array}{c} \begin{array}{c} \\ \\ \\ \end{array} \begin{array}{c} \\ \\ \end{array} \begin{array}$		
			$ \begin{array}{ c c c c }\hline + & angles \blacktriangleright end \\\hline \pi \times sign_end \blacktriangleright end \\\hline \end{array} $		
			$signs_start = \mathbf{index}(position)$		
		$\subseteq \left[\begin{array}{c} Segment2D_1 \blacktriangleright end \\ Segment2D \end{array} \right]$	$signs_start \blacktriangleright start = sign \left(\begin{array}{c} + \\ -angles_Segment2D_1 \blacktriangleright start \\ -angles_Segment2D \blacktriangleright end \\ -\pi \\ 1 \end{array} \right)$		
			$signs_start \blacktriangleright end = sign \left(\begin{array}{c} -angles_Segment2D_1 \blacktriangleright start \\ +angles_Segment2D \blacktriangleright start \\ +\pi \end{array} \right] \right)$		
			$ \begin{array}{ c c c } \hline & angles \blacktriangleright end \\ \hline & \pi \times signs_start \blacktriangleright start \end{array} $		
			$ \begin{array}{ c c c } \hline & angles \blacktriangleright end \\ \hline & \pi \times signs_start \blacktriangleright end \end{array} $		

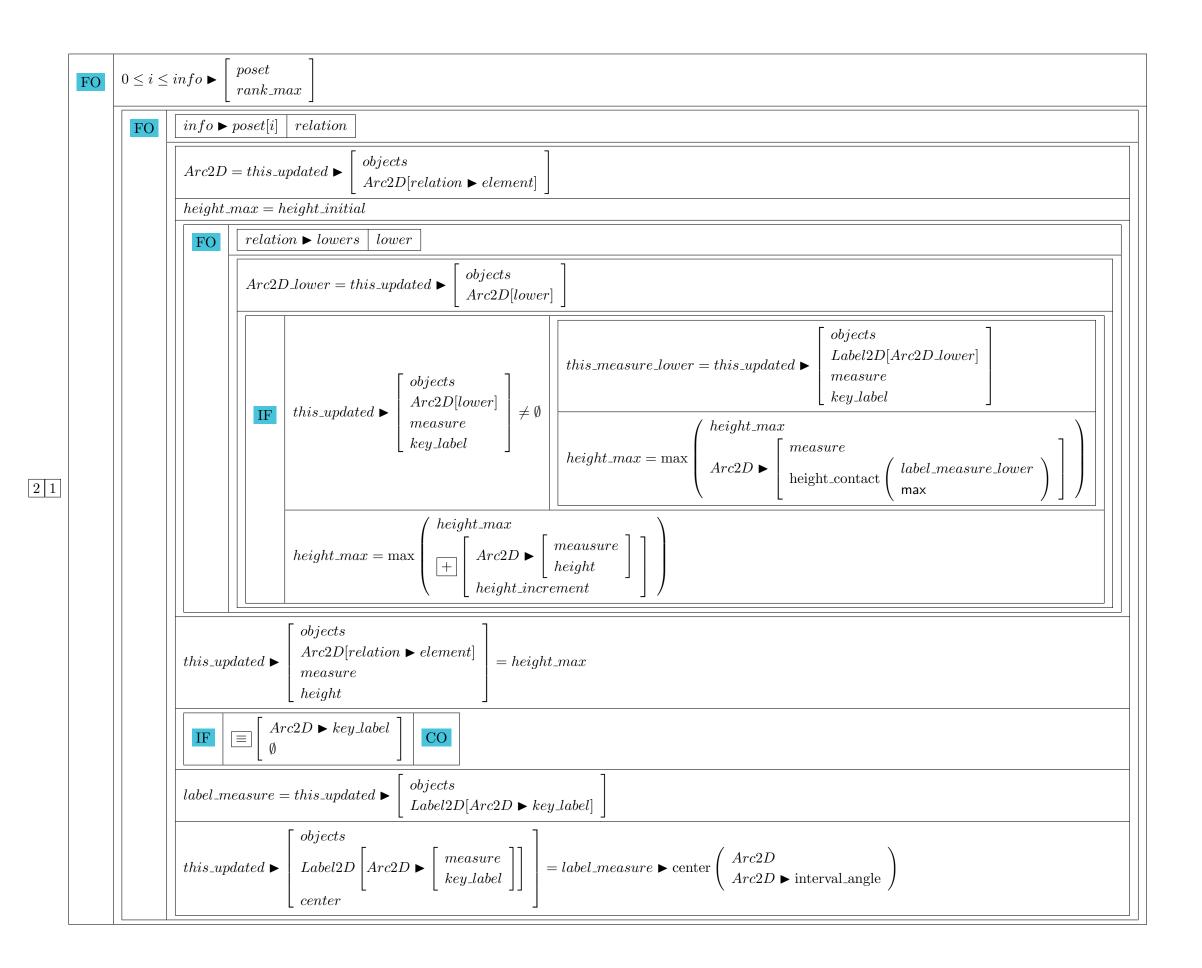
5. update update status

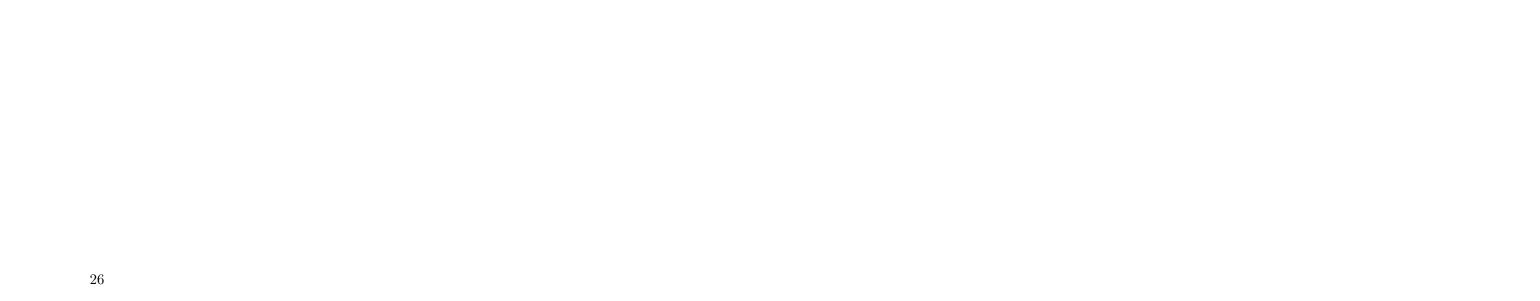
update	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$			
	$this_updated = this$			
	SW	type		
		structure	sublevel	
		Arc2D	sublevel	
		Angle2D	sublevel	
		Face2D	sublevel	
		Point2D	sublevel	
		Segment2D	sublevel	
	RE	$this_updated$		

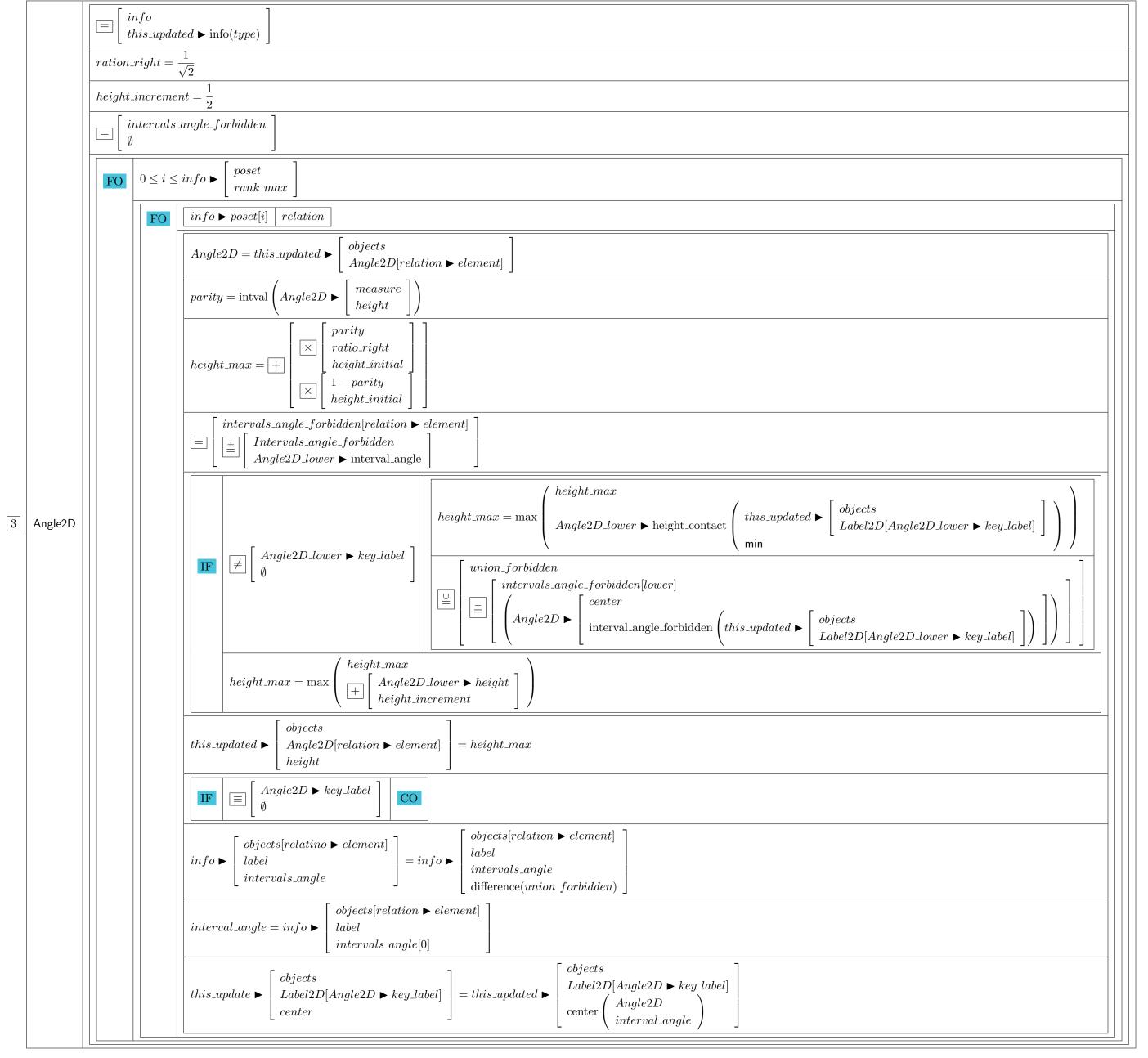


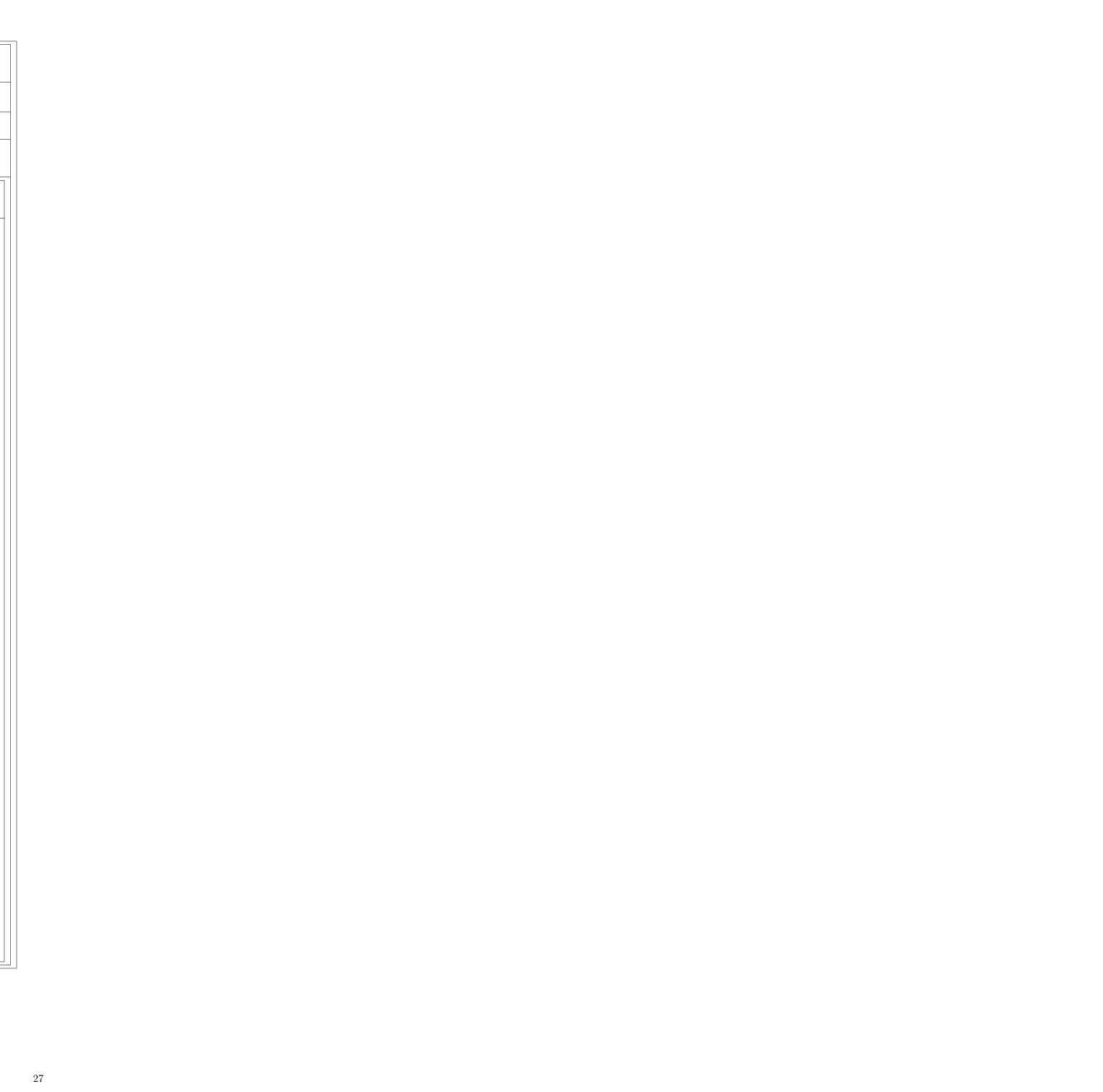


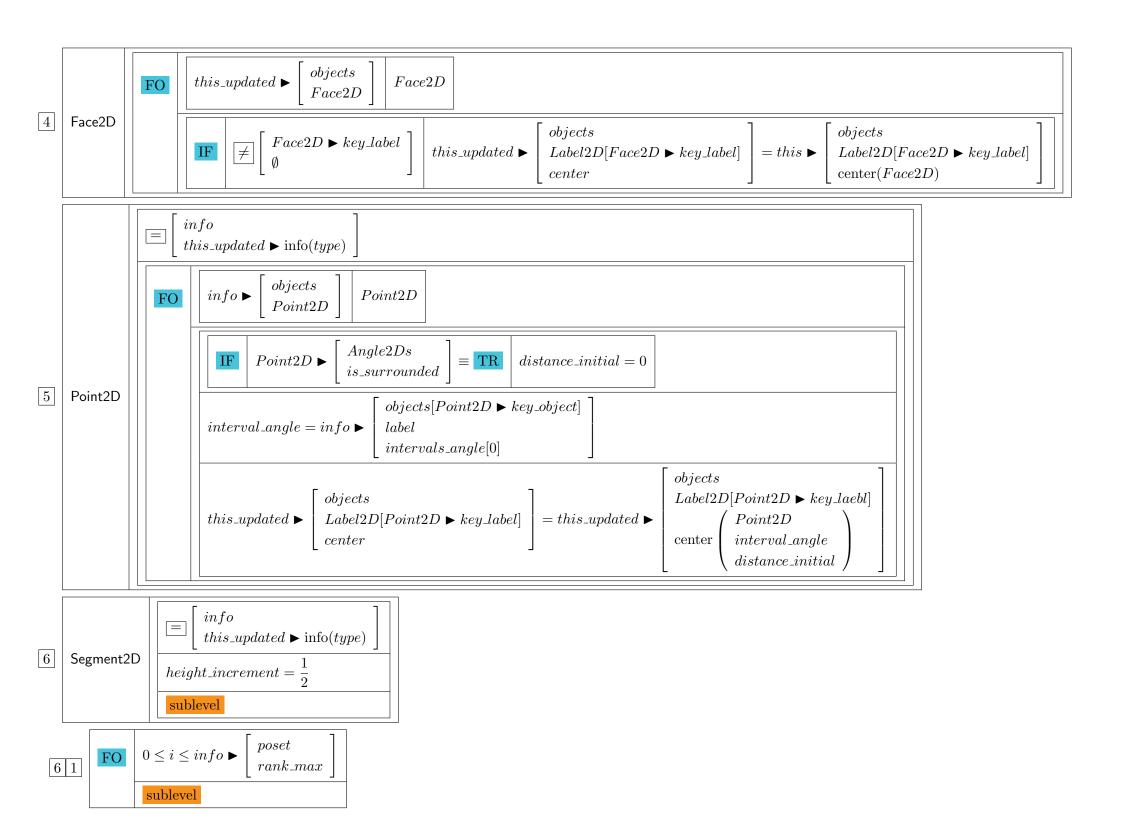


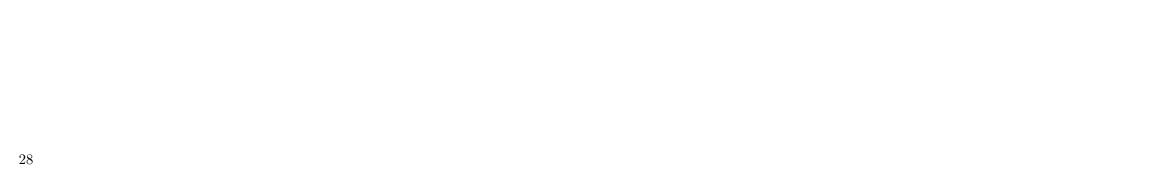


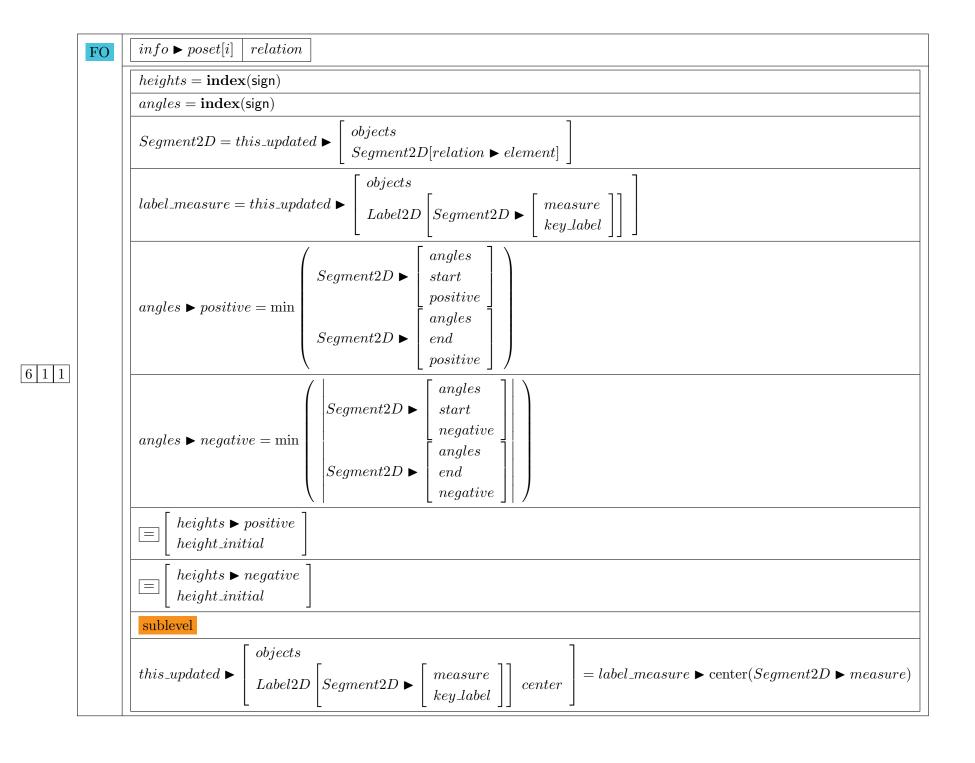


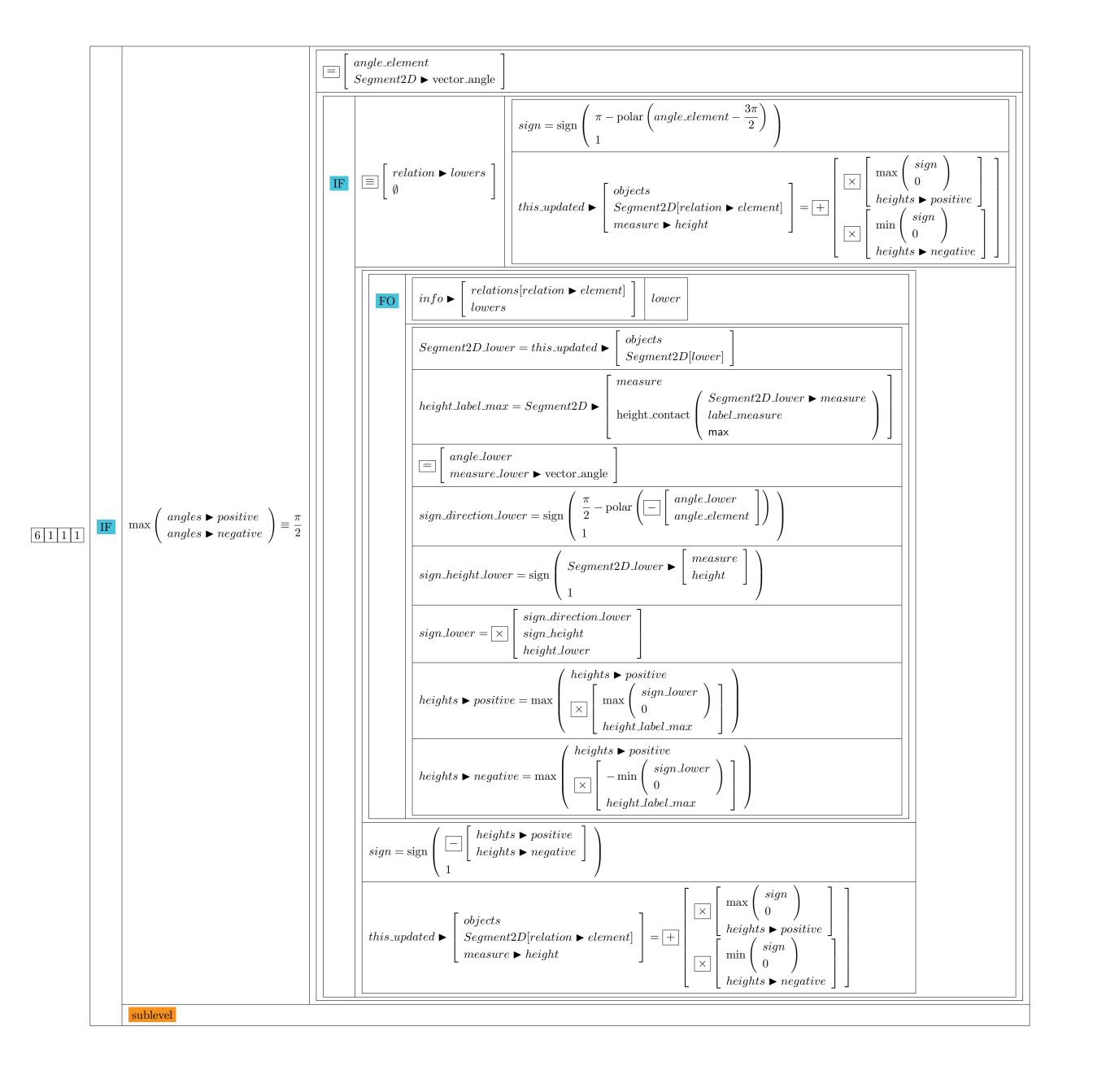




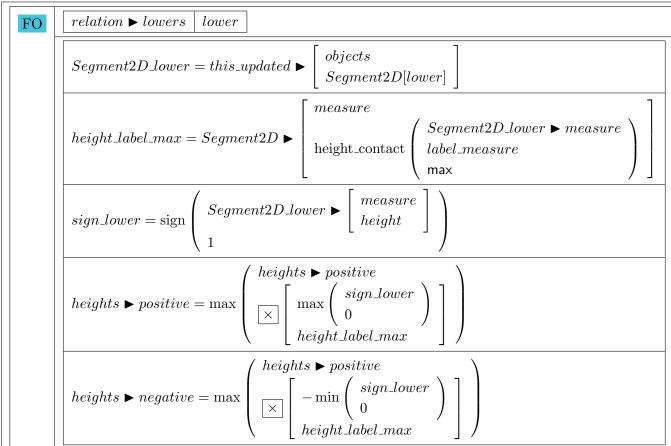












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