

# Bezigon Permutations - Tangent

Version 4.2.0 · 16 October 2026

Version 4.2.0 only; 2.2.0 has no Tangent nodes. A tangent node has two sides, and each side is decided on its own, so what matters is the kind of neighbour on either side of it.

Markers: red square = Corner (a cusp looks the same), blue circle = Smooth, orange triangle = Tangent, green = handles. The tangent under test is ringed in grey. The pictures are drawn from the library's own output, styled like the demo. The FreeHand column is blank for you to paste the matching capture.

**Compared with 4.1.0.** Every configuration here that 4.1.0 could build was also run against the original 4.1.0 code. 100 of the 102 give identical handles. The other two are steps 2 and 3 of sequence 2: in 4.1.0 a plain corner beside a tangent continued a handle pulled out of the tangent, and in 4.2.0 it keeps its handle on its chord. The two-node loops in section 4 are new, because 4.1.0 could not close two nodes.

## The rule in brief

Whether a handle exists is decided by the neighbour on that same side. Which way it points is decided by the neighbour on the other side. Its length is always 0.39 of its own segment.

The seven kinds of neighbour fall into three classes:

| Neighbour class | What it is                                                                                                    | Behaves as |
|-----------------|---------------------------------------------------------------------------------------------------------------|------------|
| none            | No neighbour on that side: the tangent is an end of an open path.                                             | absent     |
| Corner          | A plain corner, drawn with a plain click.                                                                     | flat       |
| cusp            | A Smooth node converted to a Corner. Its handles lie on its chords. New in these tables.                      | flat       |
| dragged Corner  | A Corner whose handle facing the tangent has been dragged off its chord. The 4.1.0 tables called this "cusp". | curving    |
| Smooth          | A Smooth node.                                                                                                | curving    |
| Tangent         | A Tangent whose handle facing this one is automatic.                                                          | flat       |
| pulled Tangent  | A Tangent whose handle facing this one the user has pulled out.                                               | curving    |

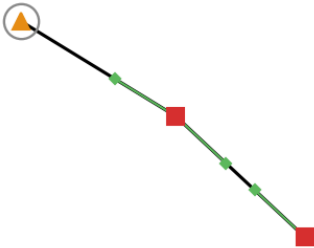
So every configuration falls into one of these nine cells. All 85 configurations in sections 1 and 2 were checked against this table, and each matches its cell:

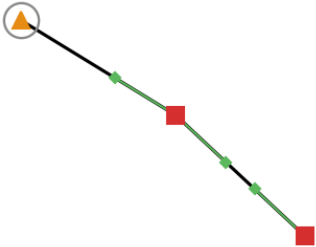
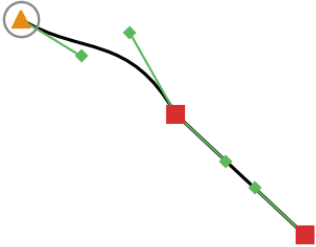
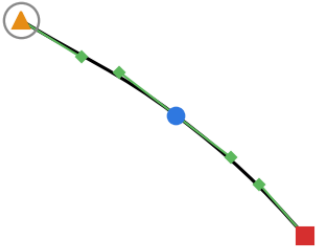
| previous \ next | absent     | flat       | curving                              |
|-----------------|------------|------------|--------------------------------------|
| absent          | no handles | no handles | out-handle only, along its own chord |

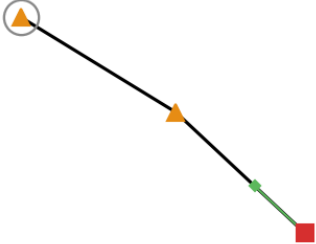
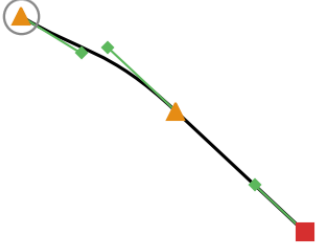
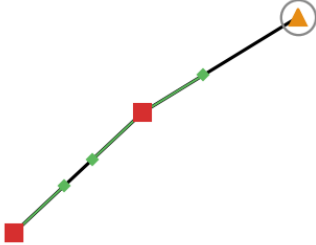
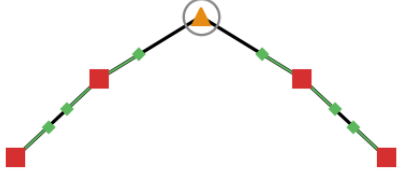
| previous \ next | absent                              | flat                                    | curving                                      |
|-----------------|-------------------------------------|-----------------------------------------|----------------------------------------------|
| flat            | no handles                          | no handles (a polygon corner)           | out-handle only, away from the previous node |
| curving         | in-handle only, along its own chord | in-handle only, away from the next node | both handles: a notch                        |

# 1. Open path: every pair of neighbours

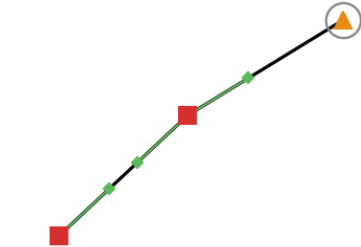
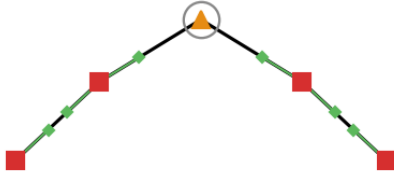
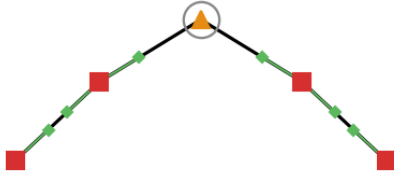
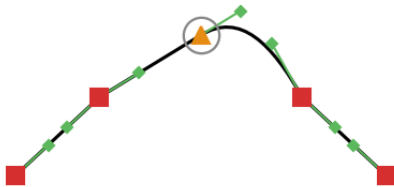
The tangent sits in the middle of an open path. The outer nodes are there only so that each neighbour has a neighbour of its own. Node positions are the same in every row, so any difference comes from the neighbour classes alone. Seven classes on each side give 49 rows.

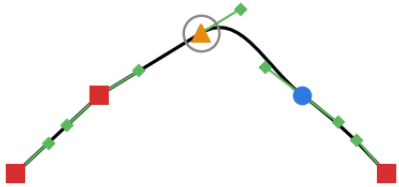
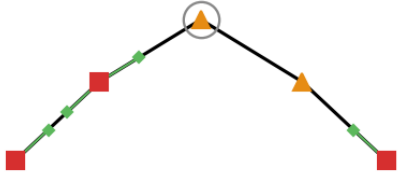
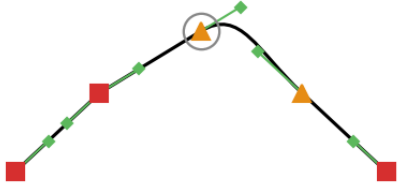
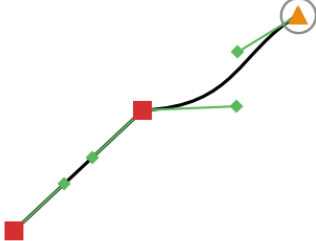
| # | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next) | Bezigon 4.2.0                                                                        | FreeHand | Notes |
|---|--------------------|----------------|----------------------------|-------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 1 | none               | none           | none                       | none                    |   |          |       |
| 2 | none               | Corner         | none                       | none                    |  |          |       |

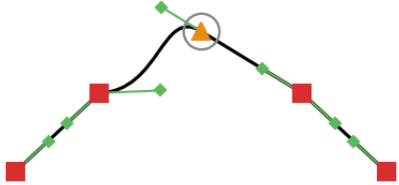
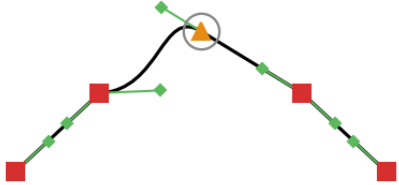
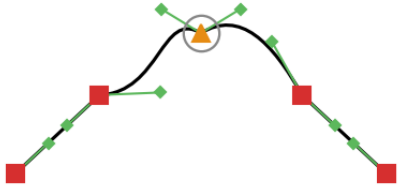
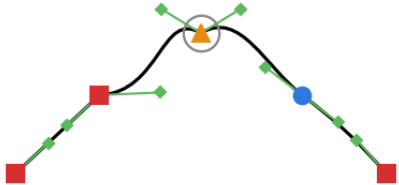
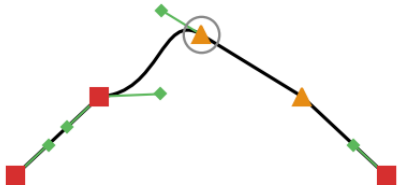
| # | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next) | Bezigon 4.2.0                                                                        | FreeHand | Notes |
|---|--------------------|----------------|----------------------------|-------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 3 | none               | cuspid         | none                       | none                    |   |          |       |
| 4 | none               | dragged Corner | none                       | along its own chord     |   |          |       |
| 5 | none               | Smooth         | none                       | along its own chord     |  |          |       |

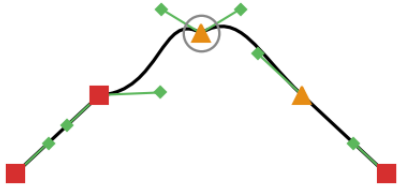
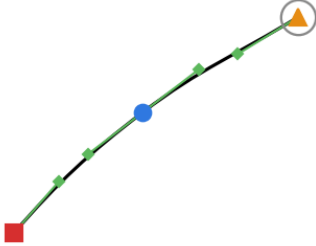
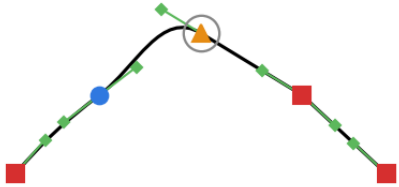
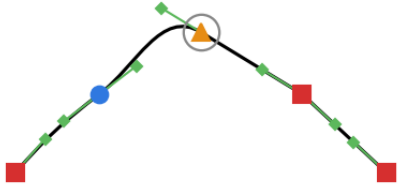
| # | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next) | Bezigon 4.2.0                                                                         | FreeHand | Notes |
|---|--------------------|----------------|----------------------------|-------------------------|---------------------------------------------------------------------------------------|----------|-------|
| 6 | none               | Tangent        | none                       | none                    |    |          |       |
| 7 | none               | pulled Tangent | none                       | along its own chord     |    |          |       |
| 8 | Corner             | none           | none                       | none                    |   |          |       |
| 9 | Corner             | Corner         | none                       | none                    |  |          |       |

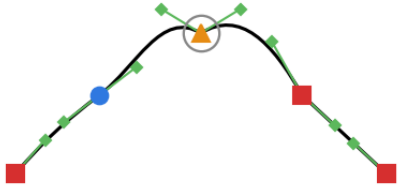
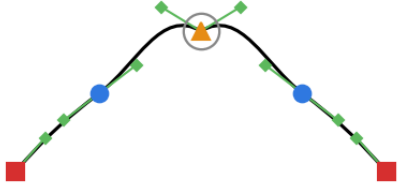
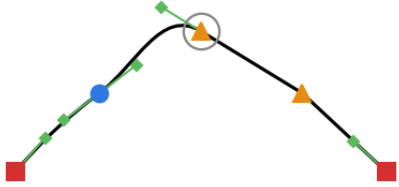
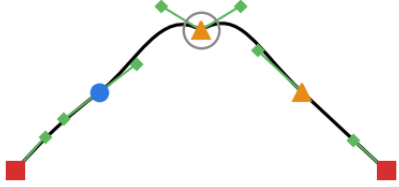
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0 | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|---------------|----------|-------|
| 10 | Corner             | cuspid         | none                       | none                        |               |          |       |
| 11 | Corner             | dragged Corner | none                       | away from the previous node |               |          |       |
| 12 | Corner             | Smooth         | none                       | away from the previous node |               |          |       |
| 13 | Corner             | Tangent        | none                       | none                        |               |          |       |
| 14 | Corner             | pulled Tangent | none                       | away from the previous node |               |          |       |

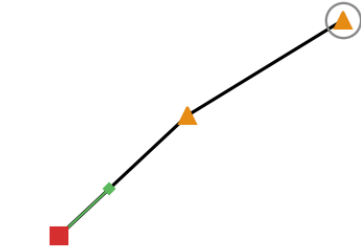
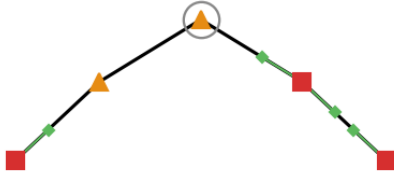
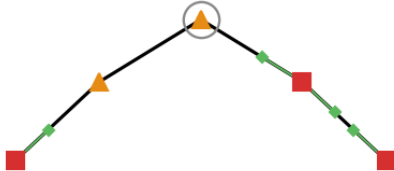
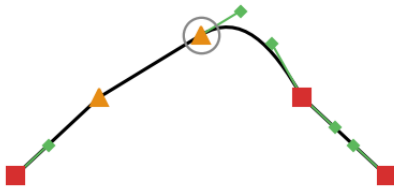
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                        | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 15 | cusp               | none           | none                       | none                        |   |          |       |
| 16 | cusp               | Corner         | none                       | none                        |   |          |       |
| 17 | cusp               | cusp           | none                       | none                        |   |          |       |
| 18 | cusp               | dragged Corner | none                       | away from the previous node |  |          |       |

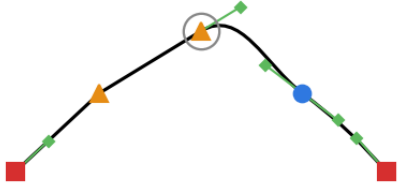
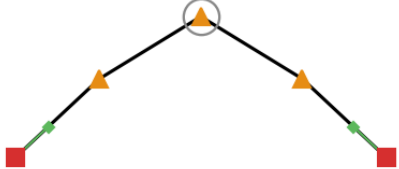
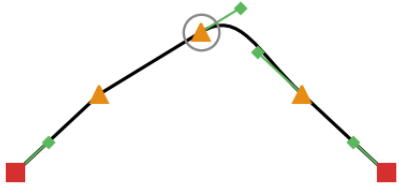
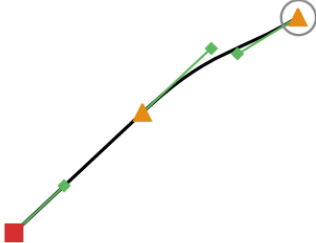
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                        | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 19 | cusp               | Smooth         | none                       | away from the previous node |   |          |       |
| 20 | cusp               | Tangent        | none                       | none                        |   |          |       |
| 21 | cusp               | pulled Tangent | none                       | away from the previous node |   |          |       |
| 22 | dragged Corner     | none           | along its own chord        | none                        |  |          |       |

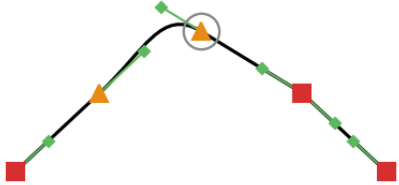
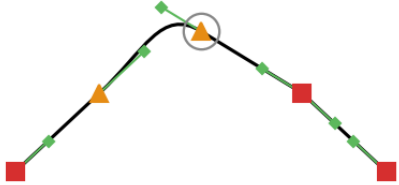
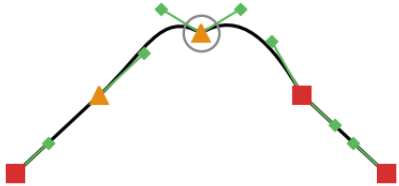
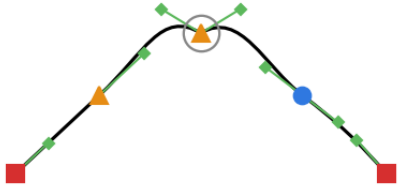
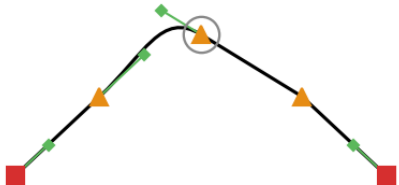
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                         | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|---------------------------------------------------------------------------------------|----------|-------|
| 23 | dragged Corner     | Corner         | away from the next node    | none                        |    |          |       |
| 24 | dragged Corner     | cuspl          | away from the next node    | none                        |    |          |       |
| 25 | dragged Corner     | dragged Corner | away from the next node    | away from the previous node |    |          |       |
| 26 | dragged Corner     | Smooth         | away from the next node    | away from the previous node |   |          |       |
| 27 | dragged Corner     | Tangent        | away from the next node    | none                        |  |          |       |

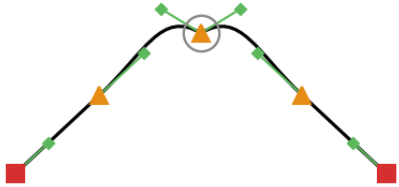
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                         | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|---------------------------------------------------------------------------------------|----------|-------|
| 28 | dragged Corner     | pulled Tangent | away from the next node    | away from the previous node |    |          |       |
| 29 | Smooth             | none           | along its own chord        | none                        |    |          |       |
| 30 | Smooth             | Corner         | away from the next node    | none                        |    |          |       |
| 31 | Smooth             | cuspl          | away from the next node    | none                        |  |          |       |

| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                        | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 32 | Smooth             | dragged Corner | away from the next node    | away from the previous node |   |          |       |
| 33 | Smooth             | Smooth         | away from the next node    | away from the previous node |   |          |       |
| 34 | Smooth             | Tangent        | away from the next node    | none                        |   |          |       |
| 35 | Smooth             | pulled Tangent | away from the next node    | away from the previous node |  |          |       |

| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                        | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 36 | Tangent            | none           | none                       | none                        |   |          |       |
| 37 | Tangent            | Corner         | none                       | none                        |   |          |       |
| 38 | Tangent            | cusp           | none                       | none                        |   |          |       |
| 39 | Tangent            | dragged Corner | none                       | away from the previous node |  |          |       |

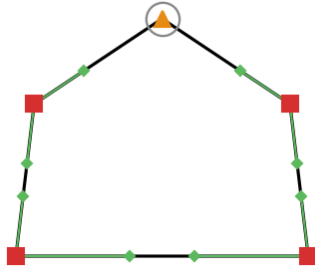
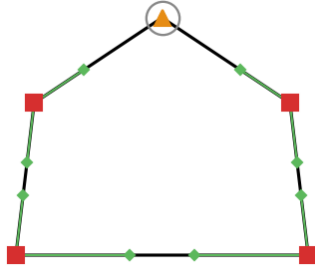
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                        | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 40 | Tangent            | Smooth         | none                       | away from the previous node |   |          |       |
| 41 | Tangent            | Tangent        | none                       | none                        |   |          |       |
| 42 | Tangent            | pulled Tangent | none                       | away from the previous node |   |          |       |
| 43 | pulled Tangent     | none           | along its own chord        | none                        |  |          |       |

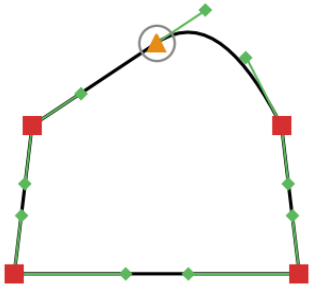
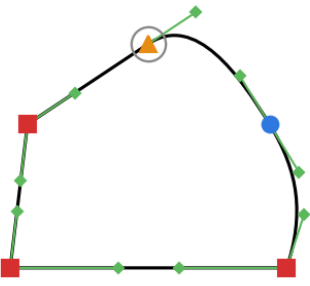
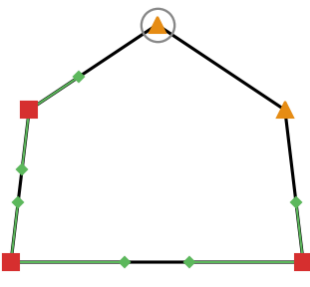
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                         | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|---------------------------------------------------------------------------------------|----------|-------|
| 44 | pulled Tangent     | Corner         | away from the next node    | none                        |    |          |       |
| 45 | pulled Tangent     | cuspl          | away from the next node    | none                        |    |          |       |
| 46 | pulled Tangent     | dragged Corner | away from the next node    | away from the previous node |    |          |       |
| 47 | pulled Tangent     | Smooth         | away from the next node    | away from the previous node |   |          |       |
| 48 | pulled Tangent     | Tangent        | away from the next node    | none                        |  |          |       |

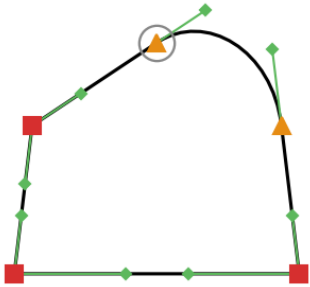
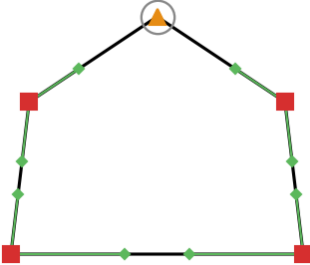
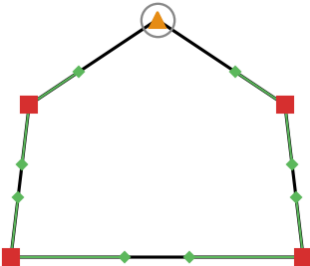
| #  | Previous neighbour | Next neighbour | In-handle (faces previous) | Out-handle (faces next)     | Bezigon 4.2.0                                                                       | FreeHand | Notes |
|----|--------------------|----------------|----------------------------|-----------------------------|-------------------------------------------------------------------------------------|----------|-------|
| 49 | pulled Tangent     | pulled Tangent | away from the next node    | away from the previous node |  |          |       |

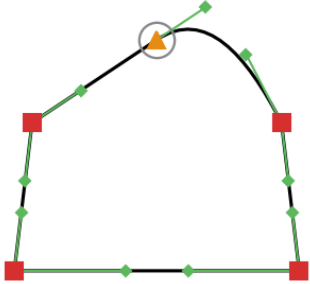
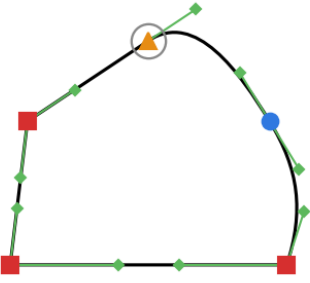
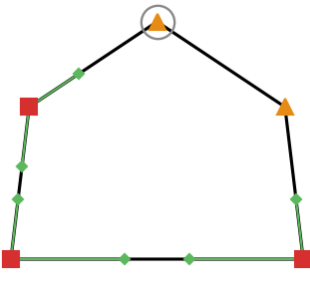
## 2. Closed path: every pair of neighbours

A side with no neighbour cannot occur on a closed path, so this leaves 36 rows. They are drawn as a five-node ring closed with a plain click, with the tangent at the apex. Positions differ from section 1, so the handle lengths differ, but the same handles are present, pointing the same way relative to their chords.

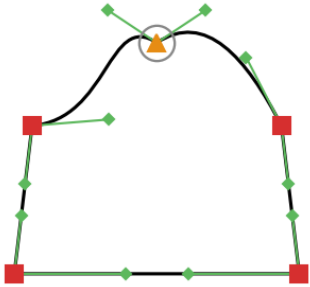
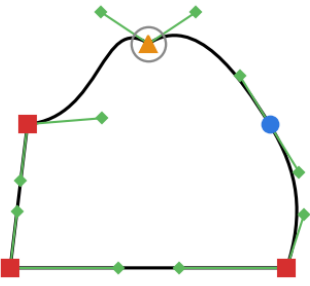
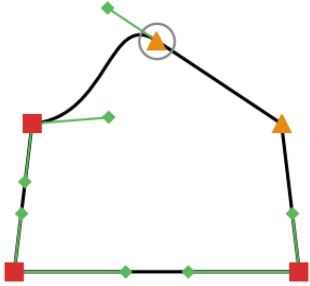
| # | Previous neighbour | Next neighbour | In-handle | Out-handle | Bezigon 4.2.0 (closed)                                                                | FreeHand | Notes |
|---|--------------------|----------------|-----------|------------|---------------------------------------------------------------------------------------|----------|-------|
| 1 | Corner             | Corner         | none      | none       |   |          |       |
| 2 | Corner             | cuspid         | none      | none       |  |          |       |

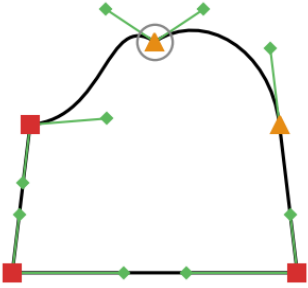
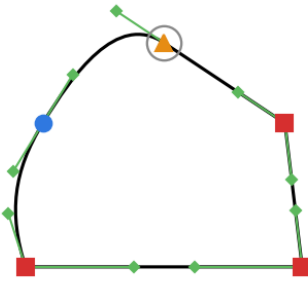
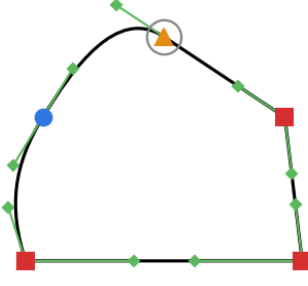
| # | Previous neighbour | Next neighbour | In-handle | Out-handle                  | Bezier 4.2.0 (closed)                                                                | FreeHand | Notes |
|---|--------------------|----------------|-----------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 3 | Corner             | dragged Corner | none      | away from the previous node |   |          |       |
| 4 | Corner             | Smooth         | none      | away from the previous node |   |          |       |
| 5 | Corner             | Tangent        | none      | none                        |  |          |       |

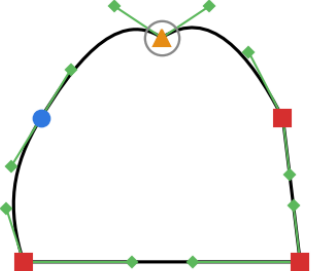
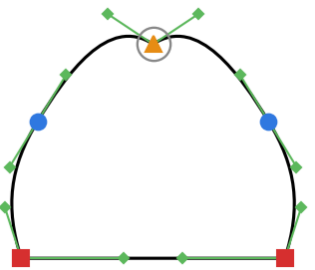
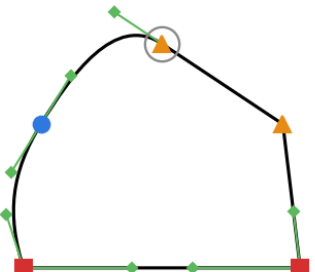
| # | Previous neighbour | Next neighbour | In-handle | Out-handle                  | Bezigon 4.2.0 (closed)                                                               | FreeHand | Notes |
|---|--------------------|----------------|-----------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 6 | Corner             | pulled Tangent | none      | away from the previous node |   |          |       |
| 7 | cusp               | Corner         | none      | none                        |   |          |       |
| 8 | cusp               | cusp           | none      | none                        |  |          |       |

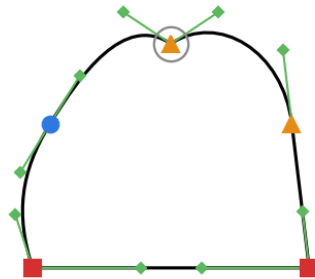
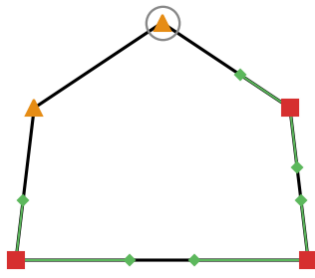
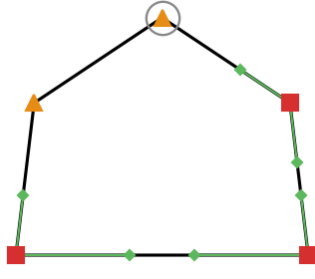
| #  | Previous neighbour | Next neighbour | In-handle | Out-handle                  | Bezier 4.2.0 (closed)                                                                | FreeHand | Notes |
|----|--------------------|----------------|-----------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 9  | cuspid             | dragged Corner | none      | away from the previous node |   |          |       |
| 10 | cuspid             | Smooth         | none      | away from the previous node |   |          |       |
| 11 | cuspid             | Tangent        | none      | none                        |  |          |       |

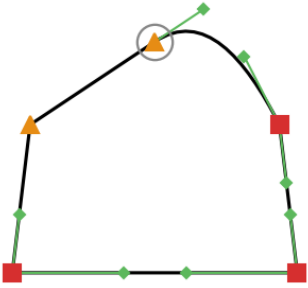
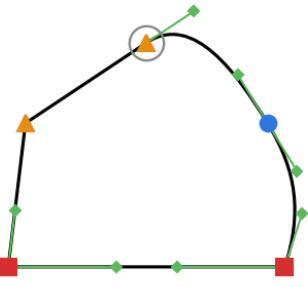
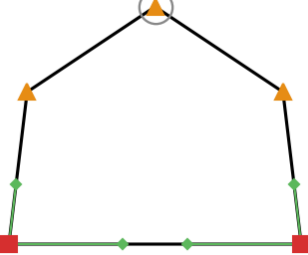


| #  | Previous neighbour | Next neighbour | In-handle               | Out-handle                  | Bezigon 4.2.0 (closed)                                                               | FreeHand | Notes |
|----|--------------------|----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 15 | dragged Corner     | dragged Corner | away from the next node | away from the previous node |   |          |       |
| 16 | dragged Corner     | Smooth         | away from the next node | away from the previous node |   |          |       |
| 17 | dragged Corner     | Tangent        | away from the next node | none                        |  |          |       |

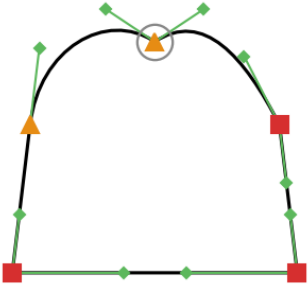
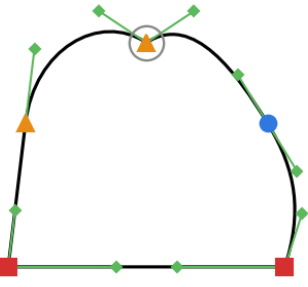
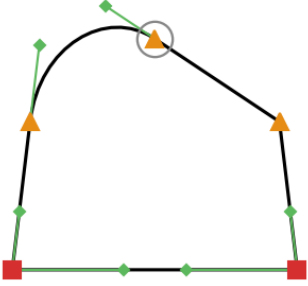
| #  | Previous neighbour | Next neighbour | In-handle               | Out-handle                  | Bezigon 4.2.0 (closed)                                                               | FreeHand | Notes |
|----|--------------------|----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 18 | dragged Corner     | pulled Tangent | away from the next node | away from the previous node |   |          |       |
| 19 | Smooth             | Corner         | away from the next node | none                        |   |          |       |
| 20 | Smooth             | cusp           | away from the next node | none                        |  |          |       |

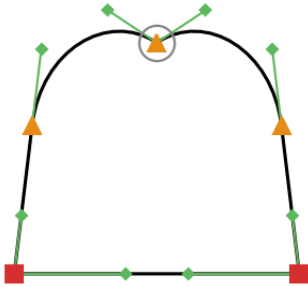
| #  | Previous neighbour | Next neighbour | In-handle               | Out-handle                  | Bezigon 4.2.0 (closed)                                                               | FreeHand | Notes |
|----|--------------------|----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 21 | Smooth             | dragged Corner | away from the next node | away from the previous node |   |          |       |
| 22 | Smooth             | Smooth         | away from the next node | away from the previous node |   |          |       |
| 23 | Smooth             | Tangent        | away from the next node | none                        |  |          |       |

| #  | Previous neighbour | Next neighbour | In-handle               | Out-handle                  | Bezigon 4.2.0 (closed)                                                               | FreeHand | Notes |
|----|--------------------|----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 24 | Smooth             | pulled Tangent | away from the next node | away from the previous node |   |          |       |
| 25 | Tangent            | Corner         | none                    | none                        |   |          |       |
| 26 | Tangent            | cusp           | none                    | none                        |  |          |       |

| #  | Previous neighbour | Next neighbour | In-handle | Out-handle                  | Bezieron 4.2.0 (closed)                                                              | FreeHand | Notes |
|----|--------------------|----------------|-----------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 27 | Tangent            | dragged Corner | none      | away from the previous node |   |          |       |
| 28 | Tangent            | Smooth         | none      | away from the previous node |   |          |       |
| 29 | Tangent            | Tangent        | none      | none                        |  |          |       |

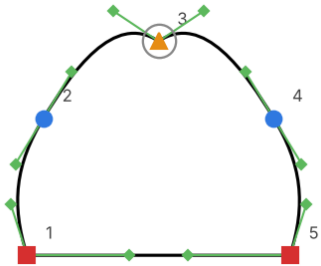
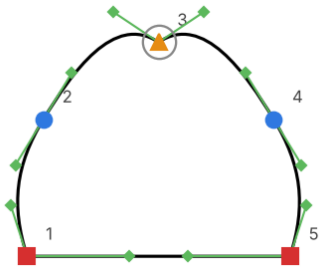


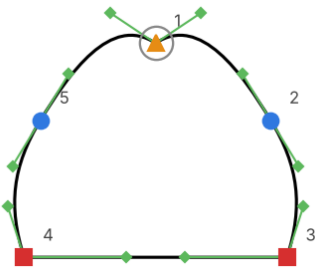
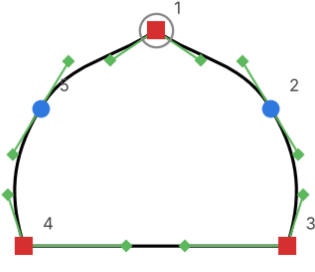
| #  | Previous neighbour | Next neighbour | In-handle               | Out-handle                  | Bezigon 4.2.0 (closed)                                                               | FreeHand | Notes |
|----|--------------------|----------------|-------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------|-------|
| 33 | pulled Tangent     | dragged Corner | away from the next node | away from the previous node |   |          |       |
| 34 | pulled Tangent     | Smooth         | away from the next node | away from the previous node |   |          |       |
| 35 | pulled Tangent     | Tangent        | away from the next node | none                        |  |          |       |

| #  | Previous neighbour | Next neighbour | In-handle               | Out-handle                  | Bezigon 4.2.0 (closed)                                                              | FreeHand | Notes |
|----|--------------------|----------------|-------------------------|-----------------------------|-------------------------------------------------------------------------------------|----------|-------|
| 36 | pulled Tangent     | pulled Tangent | away from the next node | away from the previous node |  |          |       |

### 3. Where the tangent is placed, and the close

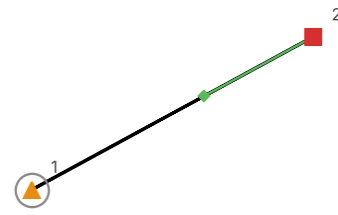
The close affects a tangent in one case only: a tangent placed first and closed with the modifier stops being a tangent.

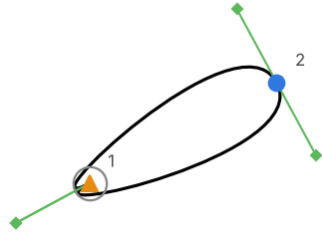
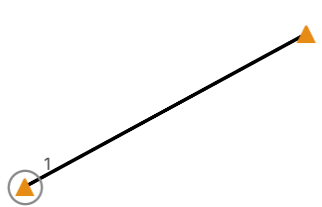
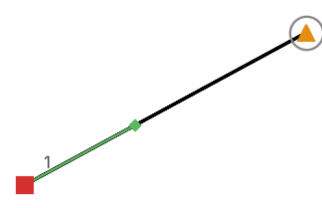
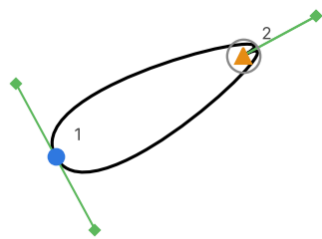
| # | Tangent  | Close | Bezigon 4.2.0                                                                       | What happens                                                                                                   | The tangent's node now                                   | FreeHand | Notes |
|---|----------|-------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------|-------|
| 1 | interior | PC    |   | Interior tangent between two Smooth nodes, plain close. Identical to the open path with the same neighbours.   | Tangent. In: away from node 4.<br>Out: away from node 2. |          |       |
| 2 | interior | MC    |  | The same with a modifier close. The close changes node 1, never an interior node, so the tangent is untouched. | Tangent. In: away from node 4.<br>Out: away from node 2. |          |       |

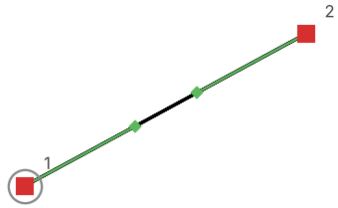
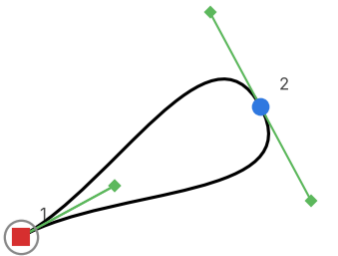
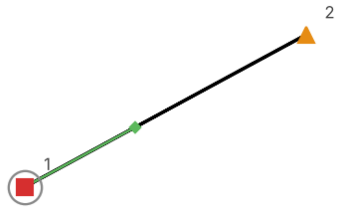
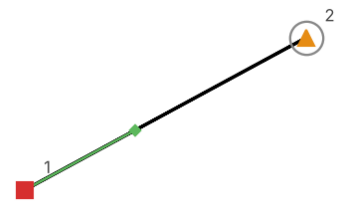
| # | Tangent      | Close | Bezigon 4.2.0                                                                     | What happens                                                                                                                                                                         | The tangent's node now                                                  | FreeHand | Notes |
|---|--------------|-------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------|-------|
| 3 | placed first | PC    |  | Tangent placed first, plain close. It stays a tangent and now has two neighbours, so it can carry two handles.                                                                       | Tangent. In: away from node 2.<br>Out: away from node 5.                |          |       |
| 4 | placed first | MC    |  | Tangent placed first, modifier close. The close turns the start node into a Corner, and because it was curved, a cusp: both handles lie along its chords. It is no longer a tangent. | cusp. In: along the chord to node 5.<br>Out: along the chord to node 2. |          |       |

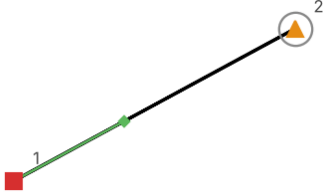
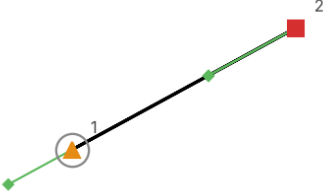
## 4. Two-node loops with a tangent

**New in 4.2.0, and not yet checked against FreeHand or Xara.** The rules apply unchanged. In a two-node loop the chord on the other side of a node is the same chord, so a tangent's handles point away from its only neighbour, and most of these shapes collapse to a doubled straight line. PhotoLine may prefer to treat a tangent in a two-node loop as a Corner.

| # | Node 1  | Node 2 | Close | Bezigon 4.2.0                                                                       | What happens                                                                                      | The nodes now                                                                                                           | FreeHand | Notes |
|---|---------|--------|-------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 1 | Tangent | Corner | PC    |  | The corner does not curve either segment, so the tangent has no handles. A doubled straight line. | Node 1: Tangent. In: none. Out: none.<br>Node 2: Corner. In: along the chord to node 1. Out: along the chord to node 1. |          |       |

| # | Node 1  | Node 2  | Close | Bezigon 4.2.0                                                                      | What happens                                                                                                                                                                                   | The nodes now                                                                                                                                          | FreeHand | Notes |
|---|---------|---------|-------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 2 | Tangent | Smooth  | PC    |   | The smooth node curves both segments, so the tangent has both handles. Each continues the chord on the other side, which here is the same chord, so both point away from node 2. An odd shape. | Node 1: Tangent. In: away from node 2. Out: away from node 2.<br>Node 2: Smooth, handles collinear. In: square to the chord. Out: square to the chord. |          |       |
| 3 | Tangent | Tangent | PC    |   | Neither tangent curves the segments. A doubled straight line.                                                                                                                                  | Node 1: Tangent. In: none. Out: none.<br>Node 2: Tangent. In: none. Out: none.                                                                         |          |       |
| 4 | Corner  | Tangent | PC    |   | As row 1, with the tangent second.                                                                                                                                                             | Node 1: Corner. In: along the chord to node 2. Out: along the chord to node 2.<br>Node 2: Tangent. In: none. Out: none.                                |          |       |
| 5 | Smooth  | Tangent | PC    |  | As row 2, with the tangent second.                                                                                                                                                             | Node 1: Smooth, handles collinear. In: square to the chord. Out: square to the chord.<br>Node 2: Tangent. In: away from node 1. Out: away from node 1. |          |       |

| # | Node 1  | Node 2  | Close | Bezigon 4.2.0                                                                      | What happens                                                                                        | The nodes now                                                                                                                                                         | FreeHand | Notes |
|---|---------|---------|-------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 6 | Tangent | Corner  | MC    |   | The modifier close makes the start tangent a cusp. A doubled straight line.                         | Node 1: cusp. In: along the chord to node 2. Out: along the chord to node 2.<br>Node 2: Corner. In: along the chord to node 1. Out: along the chord to node 1.        |          |       |
| 7 | Tangent | Smooth  | MC    |   | The start tangent becomes a cusp; the smooth node stays square to the chord. A teardrop.            | Node 1: cusp. In: along the chord to node 2. Out: along the chord to node 2.<br>Node 2: Smooth, handles collinear. In: square to the chord. Out: square to the chord. |          |       |
| 8 | Tangent | Tangent | MC    |   | The start tangent becomes a cusp; the other tangent has nothing to follow. A doubled straight line. | Node 1: cusp. In: along the chord to node 2. Out: along the chord to node 2.<br>Node 2: Tangent. In: none. Out: none.                                                 |          |       |
| 9 | Corner  | Tangent | MC    |  | The corner start node is unchanged by the close. A doubled straight line.                           | Node 1: Corner. In: along the chord to node 2. Out: along the chord to node 2.<br>Node 2: Tangent. In: none. Out: none.                                               |          |       |

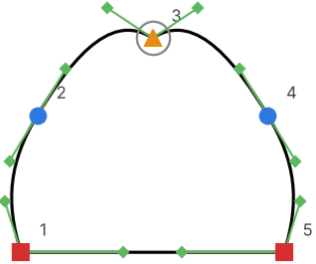
| #  | Node 1         | Node 2  | Close | Bezigon 4.2.0                                                                     | What happens                                                                                                                                                      | The nodes now                                                                                                                                | FreeHand | Notes |
|----|----------------|---------|-------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 10 | Smooth         | Tangent | MC    |  | The smooth start node becomes a cusp, which is flat, so the tangent has no handles. A doubled straight line.                                                      | Node 1: cusp. In: along the chord to node 2. Out: along the chord to node 2.<br>Node 2: Tangent. In: none. Out: none.                        |          |       |
| 11 | pulled Tangent | Corner  | PC    |  | A handle pulled out of the tangent. It lies on the tangent's axis, which here points away from node 2 along the chord. Node 2 is a corner and does not follow it. | Node 1: Tangent. In: none. Out: away from node 2 (pulled).<br>Node 2: Corner. In: along the chord to node 1. Out: along the chord to node 1. |          |       |

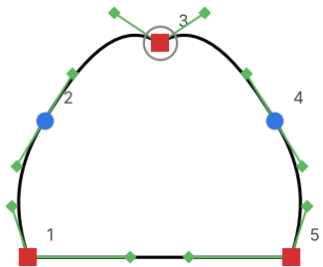
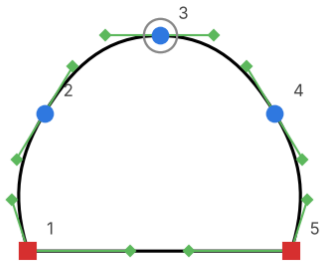
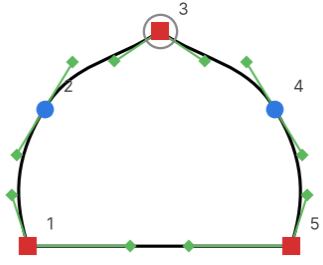
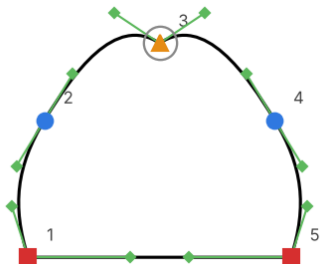
## 5. Edits after drawing

These sequences follow one path through later edits. Each row is the state after its action. In the code, node 3 is index 2.

### Sequence 1. A notch converted round the types

Converted straight to a Corner, a tangent keeps its own handles as a cusp. Made Smooth first, it loses them: the cusp after that lies on its chords. Converted back to a Tangent, the rule places the handles again.

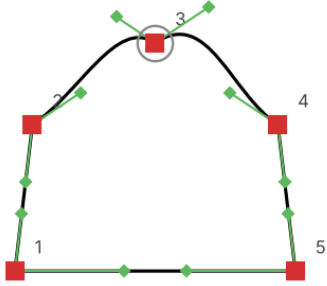
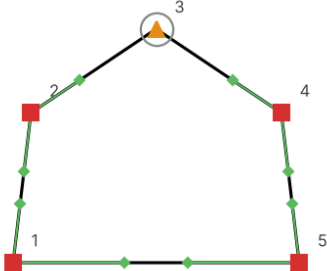
| Step | Action                                             | Bezigon 4.2.0                                                                       | The nodes now                                                 | FreeHand | Notes |
|------|----------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------|----------|-------|
| 1    | Tangent (node 3) between two Smooth nodes: a notch |  | Node 3: Tangent. In: away from node 4. Out: away from node 2. |          |       |

| Step | Action                           | Bezigon 4.2.0                                                                       | The nodes now                                                                | FreeHand | Notes |
|------|----------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------|-------|
| 2    | Node 3 converted to Corner       |    | Node 3: cusp. In: dragged. Out: dragged.                                     |          |       |
| 3    | Node 3 converted to Smooth       |    | Node 3: Smooth, handles collinear. In: on the curve. Out: on the curve.      |          |       |
| 4    | Node 3 converted to Corner again |   | Node 3: cusp. In: along the chord to node 2. Out: along the chord to node 4. |          |       |
| 5    | Node 3 converted to Tangent      |  | Node 3: Tangent. In: away from node 4. Out: away from node 2.                |          |       |

Sequence 2. Pulling handles out of a tangent between corners

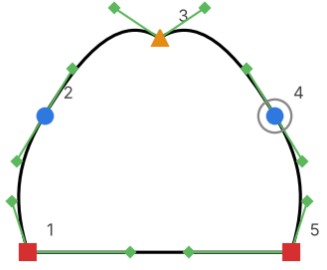
Between two plain corners a tangent has no handles. Each can be pulled out along its axis. A pulled handle bends only the tangent's own end of the segment: the corner beside it keeps its handle on the chord. A cusp keeps the pulled handles; converting back to a Tangent resets them, so the polygon corner returns.

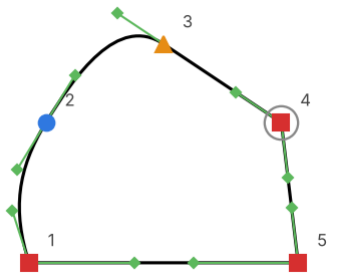
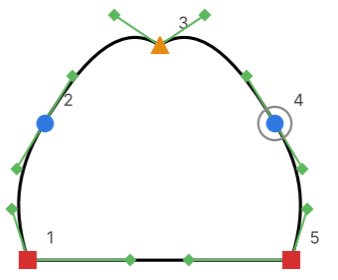
| Step | Action                                              | Bezigon 4.2.0 | The nodes now                                                                                                                                                           | FreeHand | Notes |
|------|-----------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 1    | Tangent (node 3) between two<br>Corners: no handles |               | Node 3: Tangent. In: none. Out: none.<br>Node 4: Corner. In: along the chord to node 3. Out:<br>along the chord to node 5.                                              |          |       |
| 2    | Node 3 out-handle pulled out<br>along its axis      |               | Node 3: Tangent. In: none. Out: away from node 2<br>(pulled).<br>Node 4: Corner. In: along the chord to node 3. Out:<br>along the chord to node 5.                      |          |       |
| 3    | Node 3 in-handle pulled out<br>along its axis       |               | Node 3: Tangent. In: away from node 4 (pulled). Out:<br>away from node 2 (pulled).<br>Node 4: Corner. In: along the chord to node 3. Out:<br>along the chord to node 5. |          |       |

| Step | Action                      | Bezigon 4.2.0                                                                     | The nodes now                                                                                                              | FreeHand | Notes |
|------|-----------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 4    | Node 3 converted to Corner  |  | Node 3: cusp. In: dragged. Out: dragged.<br>Node 4: Corner. In: along the chord to node 3. Out: along the chord to node 5. |          |       |
| 5    | Node 3 converted to Tangent |  | Node 3: Tangent. In: none. Out: none.<br>Node 4: Corner. In: along the chord to node 3. Out: along the chord to node 5.    |          |       |

### Sequence 3. A neighbour of the tangent converted

Converting node 4 into a cusp makes the segment between it and the tangent straight at node 4's end, so the tangent drops its handle on that side. Converting node 4 back restores everything.

| Step | Action                                    | Bezigon 4.2.0                                                                       | The nodes now                                                                                                                            | FreeHand | Notes |
|------|-------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 1    | Tangent (node 3) between two Smooth nodes |  | Node 3: Tangent. In: away from node 4. Out: away from node 2.<br>Node 4: Smooth, handles collinear. In: on the curve. Out: on the curve. |          |       |

| Step | Action                     | Bezigon 4.2.0                                                                     | The nodes now                                                                                                                            | FreeHand | Notes |
|------|----------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| 2    | Node 4 converted to Corner |  | Node 3: Tangent. In: away from node 4. Out: none.<br>Node 4: cusp. In: along the chord to node 3. Out: along the chord to node 5.        |          |       |
| 3    | Node 4 converted to Smooth |  | Node 3: Tangent. In: away from node 4. Out: away from node 2.<br>Node 4: Smooth, handles collinear. In: on the curve. Out: on the curve. |          |       |