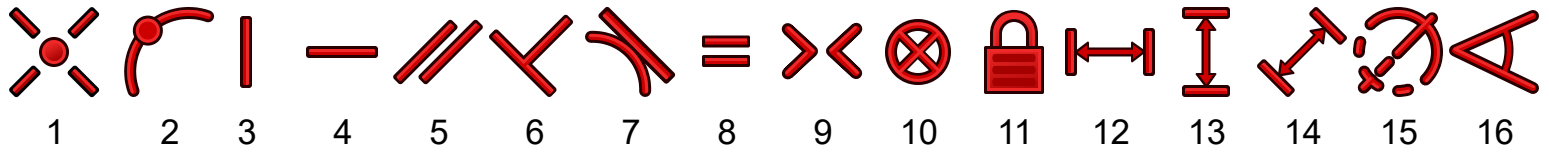


FreeCAD Cheat Sheet: Sketcher Constraints


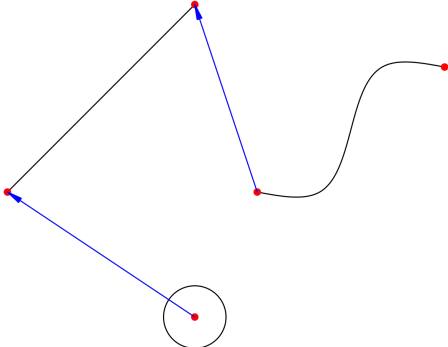
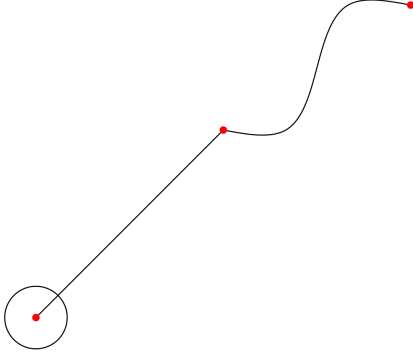



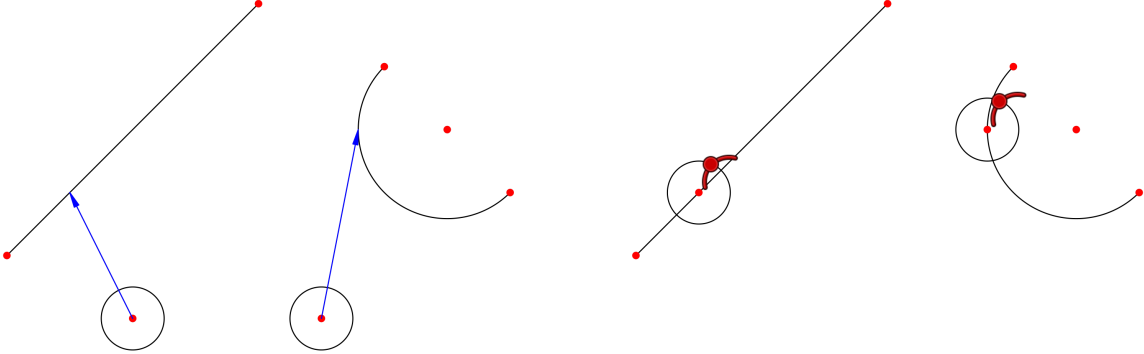


- | | |
|----------------------|-------------------------|
| 1) Coincident | 11) Lock |
| 2) Point onto Object | 12) Horizontal Distance |
| 3) Vertical | 13) Vertical Distance |
| 4) Horizontal | 14) Distance |
| 5) Parallel | 15) Radius |
| 6) Perpendicular | 16) Angle |
| 7) Tangent | |
| 8) Equal | |
| 9) Symmetric | |
| 10) Block | |


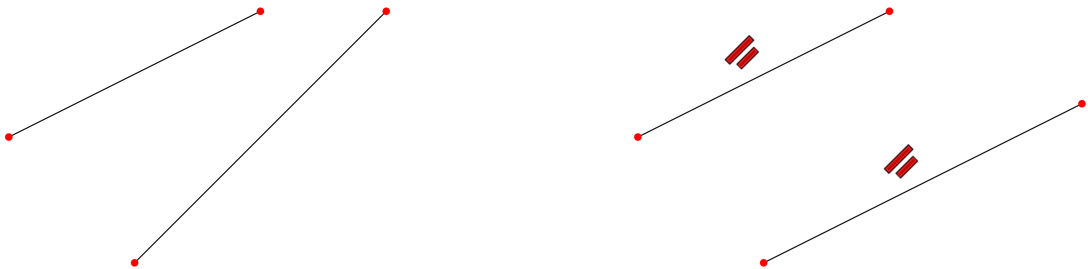
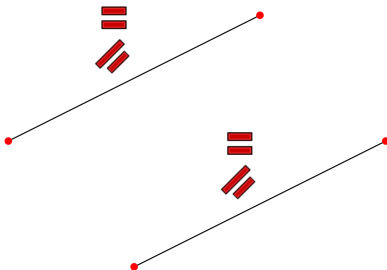
What is a constraint?


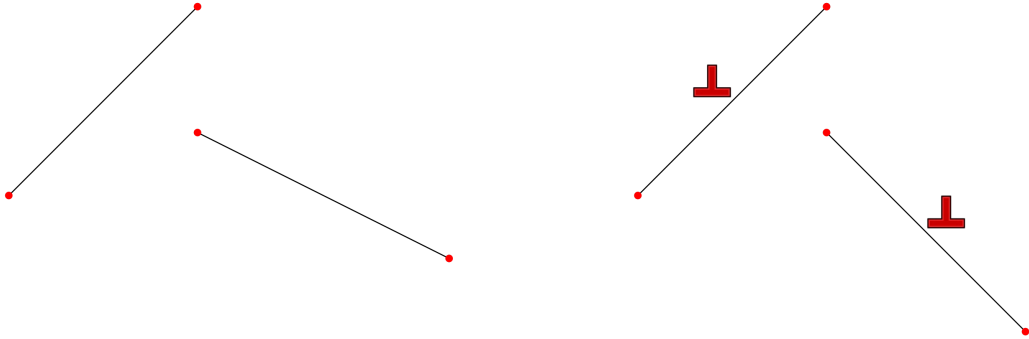
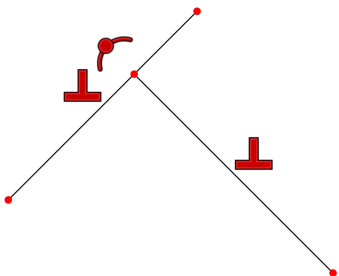
Constraints ensure points or lines with a geometric relationship stay consistent throughout the sketch.


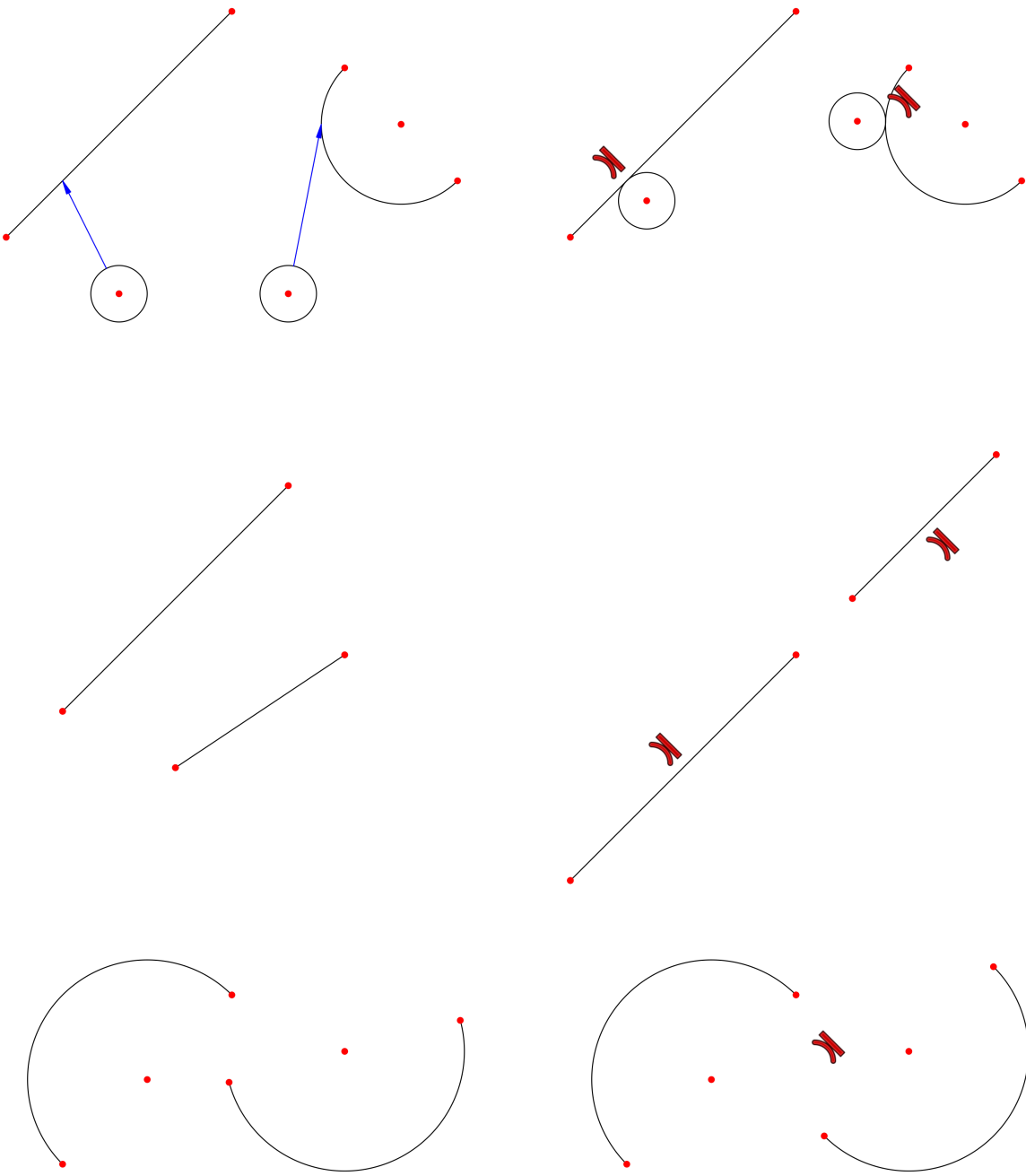




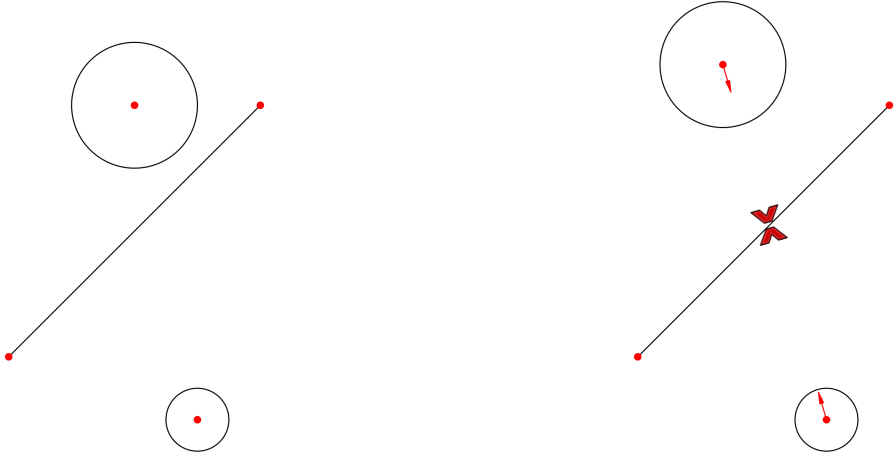
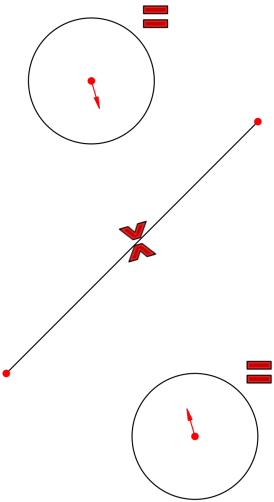
| Constraint | Description & Example |
|---|--|
|  | <p>Attach a point to another point. If both points are unconstrained the second point selected will move to the first point selected.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: right;">Coincident (C)</p> |







| Constraint | Description & Example |
|---|---|
|  | <p>Attach a point to a line or arc.</p> <div>  </div> <p>Point onto Object (O)</p> |
|  | <p>Ensures the selected line always stays vertical on this sketch plane.</p> <p>Vertical (V)</p> |
|  | <p>Ensures the selected line always stays horizontal on this sketch plane.</p> <p>Horizontal (H)</p> |




| Constraint | Description & Example |
|---|--|
|  | <p>Orients two lines to be parallel.</p> <div></div> <p>Use in conjunction with Equal to make both lines the same length.</p> <div></div> <p>Parallel (P)</p> |

| Constraint | Description & Example |
|---|---|
|  | <p>Orients two lines to be perpendicular.</p>  <p>Use in conjunction with Point on Object to create a T-shape.</p>  <p>Perpendicular (N)</p> |

| Constraint | Description & Example |
|---|--|
|  | <p>Attach an arc or ellipse to a line or another arc/ellipse. Can also be used to make two arcs/ellipses tangent and two lines collinear.</p> <div></div> <p>Tangent (T)</p> |

| Constraint | Description & Example |
|---|--|
|  | <p>Ensures two lines share the same length or an arc or circle share the same radius. If both circles or arcs are unconstrained the second shape selected will match the first shape selected.</p> <p>Equal (E)</p> |
|  | <p>Orients two points to share the same distance and angle from a line. Preselect two points and a line before invoking this command.</p>  <p>Use Equal to ensure figures symmetric across the line are mirrored. Use Distance to set the distance from the line of symmetry.</p>  <p>Symmetric (S)</p> |

| Constraint | Description & Example |
|---|--|
|  | <p>Prevents lines from changing slope/angle, length or location.</p> <p>Block (K, B)</p> |
|  | <p>Applies a Distance constraint to a point relative to the sketch origin. Preselect one point before invoking this command.</p> <p>Lock (K, L)</p> |
|  | <p>Dimensions the length of a horizontal line or distance between two points.</p> <p>Horizontal Distance (L)</p> |
|  | <p>Dimensions the length of a vertical line or distance between two points.</p> <p>Vertical Distance (I)</p> |
|  | <p>Dimensions a line or distance between two points.</p> <p>Distance (K, D)</p> |
|  | <p>Dimensions the diameter of a circle or the radius of an arc.</p> <p>Radian (K, S)</p> |

| Constraint | Description & Example |
|---|--|
|  | <p>Dimensions the radius of a circle or arc.</p> <p>Radius (K, R)</p> |
|  | <p>Dimensions the diameter of a circle.</p> <p>Diameter (K, O)</p> |
|  | <p>Dimensions the angle between two lines.</p> <p>Angle (K, A)</p> |

Sketcher Constraints: Shortcuts



Coincident (C)



Point onto Object (O)



Vertical (V)



Horizontal (H)



Parallel (P)



Perpendicular (N)



Tangent (T)



Equal (E)



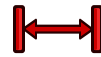
Symmetric (S)



Block (K, B)



Lock (K, L)



Horizontal Distance (L)



Vertical Distance (I)



Distance (K, D)



Radius (K, S)



Radius (K, R)



Diameter (K, O)



Angle (K, A)

Customize shortcuts!

Menu bar → Tools → Customize... →
Keyboard → Category: Sketcher

