

Rules of Inference - A Graphical Table

(Premise) You may write down a premise.

(Tautology) You may write down a tautology.

$\neg \neg P \quad \boxed{P}$ <hr/> \boxed{P}	\boxed{P} $\boxed{P} \rightarrow \text{Oval}$ <hr/> Oval
Double negation	Modus ponens
$\neg \boxed{P}$ $\boxed{P} \vee \text{Oval}$ <hr/> Oval	$\neg \text{Oval}$ $\boxed{P} \rightarrow \text{Oval}$ <hr/> $\neg \boxed{P}$
Disjunctive syllogism	Modus tollens
$\boxed{P} \rightarrow \text{Oval}$ <hr/> $\neg \boxed{P} \vee \text{Oval}$	$\neg \boxed{P}$ $\boxed{P} \rightarrow \text{Oval}$ <hr/> $\neg \text{Oval}$
Conditional disjunction	Conditional disjunction

$$\begin{array}{c} \neg(\square \vee \circlearrowleft) \\ \hline \neg\square \wedge \neg\circlearrowleft \end{array}$$

DeMorgan

$$\begin{array}{c} \neg(\square \wedge \circlearrowleft) \\ \hline \neg\square \vee \neg\circlearrowleft \end{array}$$

DeMorgan

$$\begin{array}{c} \neg\square \wedge \neg\circlearrowleft \\ \hline \neg(\square \vee \circlearrowleft) \end{array}$$

DeMorgan

$$\begin{array}{c} \neg\square \vee \neg\circlearrowleft \\ \hline \neg(\square \wedge \circlearrowleft) \end{array}$$

DeMorgan

$$\begin{array}{c} \neg(\square \rightarrow \circlearrowleft) \\ \hline \square \wedge \neg\circlearrowleft \end{array}$$

Negating a conditional

$$\begin{array}{c} \square \wedge \neg\circlearrowleft \\ \hline \neg(\square \rightarrow \circlearrowleft) \end{array}$$

Negating a conditional

$$\begin{array}{c} \square \\ \circlearrowleft \\ \hline \square \wedge \circlearrowleft \end{array}$$

Constructing a conjunction

$$\begin{array}{c} \square \\ \hline \square \vee \circlearrowleft \end{array}$$

Constructing a disjunction

The diagram consists of three separate shapes arranged horizontally. From left to right, there is a rectangle, a large letter 'A' (representing the union of two sets), and an oval.

Decomposing a conjunction

The diagram illustrates three separate geometric transformations, each consisting of a starting shape (a rectangle), a transformation arrow, and a resulting shape (an ellipse or triangle).
1. Top row: A rectangle is transformed into an ellipse by stretching it horizontally.
2. Middle row: An ellipse is transformed into an equilateral triangle by squishing it vertically until all three sides are equal.
3. Bottom row: A rectangle is transformed into an isosceles triangle by squishing it vertically, resulting in a triangle where two sides are equal.

Rule of syllogism

A diagram consisting of two shapes: a rectangle on the left and an oval on the right. A horizontal double-headed arrow connects them, indicating a reversible relationship or transformation between the two forms.

Definition of biconditional

The diagram illustrates a transformation process across three stages:

- Stage 1:** A large, empty oval shape.
- Stage 2:** An arrow points from Stage 1 to a large, empty rectangular shape.
- Stage 3:** An arrow points from Stage 2 to a large, empty oval shape.
- Stage 4:** A double-headed arrow connects the final oval shape back to the original oval shape from Stage 1.

Definition of biconditional

The diagram consists of two rows. The top row shows a rectangle on the left and an ellipse on the right, connected by a double-headed horizontal arrow, indicating they are equivalent. The bottom row shows an ellipse on the left and a rectangle on the right, connected by a single-headed arrow pointing from left to right, indicating a transformation or mapping from the ellipse to the rectangle.

Definition of biconditional

A diagram consisting of two separate parts. The left part is a rectangle. The right part is an oval. A vertical line with the letter 'V' written vertically between them separates the two shapes.

Commutativity

The diagram consists of two rows of three shapes each. The top row has a rectangle on the left, a large letter A in the center, and an oval on the right. The bottom row has an oval on the left, a large letter A in the center, and a rectangle on the right.

Commutativity