therefore sign

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The *therefore sign* "∴" is used especially in handwritten mathematical text as a shorthand of the or relations:

$$S_1 \quad \therefore \; S_2$$

It expresses that S_2 has been inferred from S_1 or from S_1 and some preceding facts. The sign is rather a punctuation mark than a symbol of logical implication. Grammatically, it could be characterised a conclusive coordinating . The usage of the symbol is not mathematically well-defined, and it often means 'we can conclude in context' or 'we can conclude from statements already shown or assumed to be true'.

For example, in determining an angle of a right triangle, one may write

$$\sin \alpha = \frac{1}{2} \quad \therefore \; \alpha = 30°$$

Here, "∴" does not a proper implication "⇒", since the exact implication here would be

$$\sin \alpha = \frac{1}{2} \quad \Leftarrow \; \alpha = 30°.$$

To obtain a strict implication, we would need to introduce some of the context. For instance, we know that, since α is an angle of a right triangle, $0° \leq \alpha \leq 90°$, so what we wrote could be interpreted as the implication

$$\sin \alpha = \frac{1}{2} \; \wedge \; 0° \leq \alpha \leq 90° \; \Rightarrow \; \alpha = 30°.$$