The map $f : H \rightarrow H$ is called differentiable, if there exists differential form $\frac{df}{dx}$ such that

$$f(x + h) - f(x) = \frac{df}{dx} \circ h + o(h)$$

where

$$o : H \rightarrow H$$

is such continuous map that

$$\lim_{a \rightarrow 0} \frac{\|o(a)\|}{\|a\|} = 0$$

Linear map $\frac{df(x)}{dx}$ is called derivative of map $f$.

The differential form

$$\omega : H \rightarrow \mathcal{L}(D; H \rightarrow H)$$

is called integrable, if there exists a map

$$f : H \rightarrow H$$

such that

$$\frac{df(x)}{dx} = \omega(x)$$

Then we use notation

$$f(x) = \int \omega(x) \circ dx$$
and the map $f$ is called indefinite integral of the differential form $\omega$.

Let $U \subseteq A$ be open set. Let 

$$\gamma : [a, b] \to U$$

be a path of class $C^1$ in $U$. We define the integral of the differential 1-form $\omega$ along the path $\gamma$ by the equality

$$\int_\gamma \omega = \int_a^b dt \omega(\gamma(t)) \frac{d\gamma(t)}{dt}$$

Differential form

$$\omega : H \to \mathcal{L}(D; H \to H)$$

is integrable iff

$$d\omega(x) = 0$$

For any quaternions $a, b$, we define definite integral by the equality

$$\int_a^b \omega = \int_\gamma \omega$$

which does not depend on a path $\gamma$ from $a$ to $b$. (Received September 08, 2020)