

Lösungen Quiz 19

Version A

$$\int_0^{\frac{\pi}{2}} \int_0^{\pi} \sin(x - y) \, dx dy = ?$$

- (a) -4
- (b) -2
- (c) 0
- (d) 2
- (e) 4

Lösung:(d)

Wir berechnen:

$$\begin{aligned} \int_0^{\frac{\pi}{2}} \int_0^{\pi} \sin(x - y) \, dx dy &= \int_0^{\frac{\pi}{2}} -\cos(x - y) \Big|_0^{\pi} dy \\ &= - \int_0^{\frac{\pi}{2}} \cos(\pi - y) - \cos(-y) dy \\ &= - \left[-\sin(\pi - y) + \sin(-y) \right]_0^{\frac{\pi}{2}} \\ &= - \left[-1 + 0 + (-1) - 0 \right] \\ &= 2 \end{aligned}$$

Version B

Bitte wenden!

$$\int_0^\pi \int_0^{\frac{\pi}{2}} \sin(x - y) \, dx dy = ?$$

(a) -4

(b) -2

(c) 0

(d) 2

(e) 4

Lösung: (b)

Wir berechnen:

$$\begin{aligned} \int_0^\pi \int_0^{\frac{\pi}{2}} \sin(x - y) \, dx dy &= \int_0^\pi -\cos(x - y) \Big|_0^{\frac{\pi}{2}} dy \\ &= - \int_0^\pi \cos\left(\frac{\pi}{2} - y\right) - \cos(-y) \, dy \\ &= - \left[-\sin\left(\frac{\pi}{2} - y\right) + \sin(-y) \right]_0^\pi \\ &= - \left[-(-1) + 1 + 0 - 0 \right] \\ &= -2 \end{aligned}$$