

restart : Digits := 16

$$Digits := 16 \quad (1)$$

$$f1 := \frac{A}{\sqrt{A^4 - A^4 \cdot u^4}}$$

$$f1 := \frac{A}{\sqrt{A^4 - A^4 \cdot u^4}} \quad (2)$$

#integrate(f1, u = 0 .. 1)
f2 := convert(series(f1, A = 0, 4), polynom) assuming A > 0

$$f2 := \frac{1}{\sqrt{-u^4 + 1} A} \quad (3)$$

integrate(f2, u = 0 .. 1)

$$\frac{B\left(\frac{1}{4}, \frac{1}{2}\right)}{4 A} \quad (4)$$

$$f2 \quad (5)$$

$$eq := \% = \frac{T}{\sqrt{2} \cdot 4}$$

$$eq := \frac{B\left(\frac{1}{4}, \frac{1}{2}\right)}{4 A} = \frac{T \sqrt{2}}{8} \quad (6)$$

Tsol := evalf(solve(% , T))

$$Tsol := \frac{7.416298709205488}{A} \quad (7)$$

F := subs(A = 0.001, f1); integrate(F, u = 0 .. 1)

$$F := \frac{0.001}{\sqrt{1.10^{-12} - (1.10^{-12}) \cdot u^4}} \quad (8)$$

$$evalf(\%) = \frac{T}{\sqrt{2} \cdot 4}; solve(\%, T)$$

$$1311.028777146060 = \frac{T \sqrt{2}}{8} \quad (9)$$

evalf(subs(A = 0.001, Tsol))

$$7416.298709205488 \quad (10)$$