Algorithm 1 Calculate Logarithm Function

Require: value: $x > 0$ And base: $b \neq 1 \vee b > 0$ ▷ where $x, b \in \mathcal{R}^+$
Ensure: $result = \log_b x$

```
procedure CalculatePower(base, exponent)
    power ← 1
    for i ← 1, exponent do
        power ← power * base
    end for
    return power                    ▷ It returns the base to the power exponent
end procedure

procedure CalculateNaturalLog(value)
    sum ← 0
    j ← (value − 1)/(value + 1)
    for i ← 1, ∞ do
        k ← (2 * i) − 1
        sum ← sum + (1/k) * CalculatePower(j, k)
    end for
    return 2 * sum                  ▷ It returns ln using series expansion.
end procedure

a ← CalculateNaturalLog(x)          ▷ Calculates lnx
b ← CalculateNaturalLog(b)          ▷ Calculates lnb
result ← a/b                        ▷ Final result of log_b x
```