

Find the functions f , g , u , and v such that:

$$c(p) = f(x)g(h+p) + u(x)v(w+p)$$

where h and w are defined by the definite integrals:

$$h(x) = \int_0^x f(x)dx \quad w(x) = \int_0^x u(x)dx$$

and c is a function of p , but a constant in x , i.e.:

$$\frac{\partial c}{\partial p} \neq 0 \quad \frac{\partial c}{\partial x} = 0$$

The functions f , g , u , and v each have the following properties:

- Continuous, real, and non-infinite.
- Non-zero, i.e. always positive or always negative.
- All functions are harmonic with the same period, a , i.e.:

$$\begin{aligned} f(x) &= f(x+n \cdot a) & g(x) &= g(x+n \cdot a) \\ u(x) &= u(x+n \cdot a) & v(x) &= v(x+n \cdot a) \end{aligned}$$

where n is an integer.