Decomposition of function over flat waves

Very important formula

$$F(\mathbf{R}) = \Delta_y \int_{\mathbf{n}=1} F(\mathbf{x})|(\mathbf{x}-\mathbf{y})\mathbf{n}|d^{n-1}\mathbf{n}d^n\mathbf{y}$$

(up to coefficients)

Calculate first for $n = 3$ Up to coefficient

$$F(\mathbf{x}) = \int F(\mathbf{y})\delta(\mathbf{x}-\mathbf{y})d^3y = \Delta_y \int F(y)|\mathbf{x}-\mathbf{y}|^{-1} = \Delta^2_{(y)}i\left(\int F(y)|\mathbf{x}-\mathbf{y}|d^y\right) =$$

$$\Delta^2_{(y)}i\left(\int F(y)|(\mathbf{x}-\mathbf{y},\mathbf{n})|d\mathbf{n}d^y\right).$$