8. $\displaystyle\int_0^\infty \frac{y(x+t)-y(x-t)}{t}\,dt = f(x).$

Solution: $\displaystyle y(x) = -\frac{1}{\pi^2}\int_0^\infty \frac{f(x+t)-f(x-t)}{t}\,dt.$

References

Ditkin, V. A. and Prudnikov, A. P., *Integral Transforms and Operational Calculus*, Pergamon Press, New York, 1965.

Polyanin, A. D. and Manzhirov, A. V., *Handbook of Integral Equations*, CRC Press, Boca Raton, 1998.

