1063-91-85    **Judea Pearl\***, Department of Computer Science, 4732 Boelter Hall, UCLA, Los Angeles, CA 90095. *The Mathematics of Cause and Effect.*

I will review concepts, principles, and mathematical tools that were found useful in applications involving causal relationships (J. Pearl, Causality, Cambridge University Press, 2nd edition, 2009). The principles are based on structural-model semantics, in which functional (or counterfactual) relations represent autonomous physical processes. This semantical framework, enriched with a few ideas from logic and graph theory, gives rise to a complete, coherent, and friendly calculus that resolves long-standing problems involving causal and counterfactual relationships. These include questions of policy analysis, responsibility assignment and mapping the data-generating mechanisms. (Received August 06, 2010)