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Charles W Groetsch* (groetsch@uc.edu), Department of Mathematical Sciences, P.O. Box 210025, Cincinnati, OH 45221-0025. *A Celestial Cubic.*

The Greek philosopher Epicurus (342?-270 BC) espoused an infinity of worlds like our own. In modern times belief in the existence of extra-solar planets has been nearly universal, yet the immense inter-stellar distances involved have defeated efforts directly to observe such planets. Recently convincing indirect evidence of planets orbiting specific stars has emerged. This new indirect evidence for extra-solar planets is spectral data - subtle Doppler shifts resulting from the gravitational tug-of-war between the star and its planet. In this paper we report on experience using a simple inverse problem of determining the mass and orbital radius of an extra-solar planet in a course in mathematical modeling for in-service high school mathematics teachers. The model leads to an interesting cubic equation that is used to illustrate some points in mathematical analysis and computation, as well as to identify the mass and orbital radius of a specific possible extra-solar planet. The goal is simply to show that classroom mathematics, at the level of elementary mathematical analysis, is related in a meaningful way to a problem that is both old and scientifically au courant. (Received September 29, 2000)