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Glen Van Brummelen*, Quest University, 3200 University Blvd., Squamish, BC. *Reasonable effectiveness: Trigonometry, ancient astronomy, and the birth of applied mathematics.*

Trigonometry, one of the oldest of the mathematical sciences, was born in ancient Greece from the need to predict the positions of the heavenly bodies. The arrival of an efficient place value number system from Babylon allowed geometry to become quantitative, changing the astronomical game entirely. Astronomers and geographers in Greece, and later in India and medieval Islam, now had unprecedented powers to describe mathematically the world they observed around them. Not least among trigonometry's accomplishments was its role in one of the most successful predictive theories in the history of science: Ptolemy's epicyclic model of planetary motion. The fact that this model was completely wrong, yet its mathematics proved fundamental to the growth of science for at least two millennia, leads to some interesting speculations on Wigner's observation of the unreasonable effectiveness of mathematics in the natural sciences. (Received March 24, 2009)