

## More examples of short answer questions

Which came first, the measurement results for Torricelli's Trumpet or the discovery of the binomial series? (Torricelli's result on finite volume enclosed by an infinite surface area came a generation before Newton described an infinite series for nonintegral powers of  $1 + x$ )

Name one 16<sup>th</sup> century mathematician who expressed his problems entirely in verbal terms and another who used a considerable amount of symbolic notation, and indicate one area in which both worked. (Cardan and Viète, both of whom studied cubic equations, but Cardan used verbal terms and Viète used symbols)

What was al-Khwarizmi's main contribution in his book *al-jabr*? Was it new methods for solving equations? If not, what was it? (No to the first part. It was looking at solving equations as something in its own right rather than steps in getting answers to other questions)

When did trigonometry first get treated as a separate part of mathematics? (In the late Middle Ages, by Nasreddin in Arabic Mathematics and later by Regiomontanus in Europe)

Give an example of a major civilization which made few if any major contributions to mathematics. (Roman civilization)

Were maximization and minimization problems studied before the seventeenth century? Explain. (Yes, but with only limited techniques. For example, the Greek mathematician Zenodorus made several nontrivial discoveries)