Math History for Precalculus

Henri Poincaré

1. When did Henri Poincaré (pwan kah RAY) live? *1854–1912*

2. Where was he from? *France (Nancy)*

3. In what way is Poincaré often compared to Gauss? *as being a mathematical universalist— contributing to all branches of math known in his day and publishing almost 500 works*

4. His dissertation was on differential equations of calculus. Later he wrote two major works in astronomy (3 volumes each). Name the astronomical works. *Les methodes nouvelles de la mécanique céleste (1892–1899), Leçons de mécanique céleste (1905–1910)*

   Poincaré shares the honor (with Brouwer) as the father of one branch of modern mathematics.

5. Name this branch of mathematics. With which of the divisions of this branch was he primarily concerned? *topology, combinatorial topology*

6. Name Poincaré's work which laid important foundations of this subject. *Analysis Situs*

7. When was this published? *1895*

   He also contributed to non-Euclidean geometry, offering models of hyperbolic geometry (see *Geometry for Christian Schools*, Chapter 10, and corresponding activities). His models have both advantages and disadvantages compared to the Beltrami-Klein model you may have studied (in the activity "Hyperbolic Geometry in Principle"). Trigonometry in Poincaré's model gives rise to the hyperbolic trig functions.

8. Poincaré was extremely uncoordinated, which explains his abominable performance in two areas, one of which almost prohibited his acceptance at the Polytechnic School. Name these areas. *Physical exercises and art (drawing). His drawings almost disqualified him. He was popular but his fellow students joked about his drawings (making an exhibition with titles such as "This is a horse" in Greek).*

9. Poincaré was incredibly gifted mentally. Explain. *He had a photographic memory, able to refer by page number and line to whatever he read. He took first prize in math without taking any lecture notes. This power of concentration was still strong even after his vision grew poor.*

10.   Poincaré took supplementary teaching positions, visited European cities for math conferences, and visited St. Louis, Missouri, in 1904. But throughout his travels, he continued working for what department? *Dept. of Mines*