Math and Cookies
Big Numbers in Little Problems

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This cute problem will give us an excuse to start exploring the connections between different branches of mathematics. We will get our toes wet by first finding all Pythagorean triples (positive integers a, b, c with $a^2 + b^2 = c^2$ like 3,4,5) using a lovely geometric idea: a line through a point intersecting a circle. Moving on to positive integers with the relation $\frac{a}{b+c} + \frac{b}{a+c} + \frac{c}{a+b} = 4$, we will find ourselves wading into the deep waters of elliptic curves, where integers, geometry, algebra, analysis, and computer science all connect. Appreciation for cool math and/or a dash of intellectual curiosity will be plenty of background.