Abstract: We know much about the transcendence of algebraic integrals like

$$\int_0^1 \sqrt{-\frac{1}{2} - x^2 + \frac{\sqrt{1+8x^2}}{2}}\mathrm{d}x = .250\ldots, \quad \int_0^1 \frac{\mathrm{d}x}{(\frac{35}{11}+x)\sqrt{1+x^3}} = .250\ldots.$$

Here the first arises from the area of a lemniscate considered by Count Fagnano, who in fact was more interested in the arc length (which we shall also consider). But how does one actually determine whether given integrals like the above are transcendental or not? In this talk I review some of what was known, and I also sketch an effective (and reasonably practical) method for integrals such as these.