LET THE CENTRAL ANGLE = 2 ϕ

$$2 R \phi = L = 101', \text{ with } \phi \text{ expressed in radians, so that } \phi = \frac{50.5}{R}$$

$$2R \sin \phi = \text{chord} = 100', \text{ with } \phi \text{ expressed in degrees, so that } \sin \phi = \frac{50}{R}$$

$$\frac{\sin \phi}{\phi} = \frac{50 / R}{50.5 / R} = 0.990099009901$$

From trigonometry:

$$\sin \phi = \phi - \frac{\phi^3}{3!} + \frac{\phi^5}{5!} - \frac{\phi^7}{7!} + \frac{\phi^9}{9!} - \ldots$$

$0.990099009901 = 1 - \dfrac{\phi^2}{6} + \dfrac{\phi^4}{120}$, *ignoring all powers above the fourth*

multiplying by 120 and rearranging, $\phi^4 - 20\phi^2 + 1.1881188118811 = 0$

and, by utilizing the quadratic equation

$$\phi = \frac{\sqrt{(20) \pm \sqrt{(20)^2 - (4)(1.1881188118811)}}}{\sqrt{2}}$$

(For the purists:

ϕ = 4.465469 and 0.244097   0.2440966956936829825

or 255°51'09.1" and 13°59'08.6"   13°59'08.55764281396"

so that R = 206.885' (from the chord equation)   206.8852257769702271')