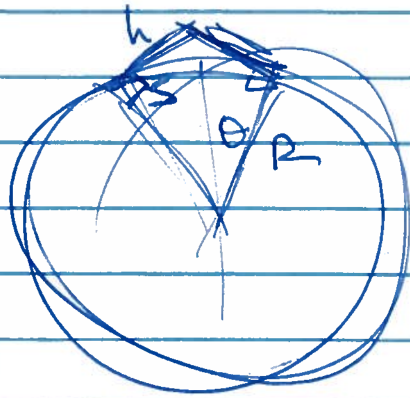

$$s = R\theta$$

$$h = R \cdot \tan\theta$$

$$2h - 2s = \Delta l.$$

$$\tan\theta - \theta = \frac{\Delta l}{2R} = \frac{1\text{ ft}}{2(4000)(5000\text{ ft})}$$

$$= \frac{1}{40 \cdot 10^6} = 2.5 \times 10^{-8}$$

"Solve was unable to solve the problem with inexact coefficients or the system obtained by direct rationalization of inexact numbers present in the system. Since many of the methods used by solve require exact input, providing solve with an exact version of the system may help."

10^{-8}

"This system cannot be solved with the methods available to Solve"

$\frac{\Delta l}{2R}$

root $0.00421715 \rightarrow 2.49998 \times 10^{-8}$

$0.00421716 \rightarrow 2.50001 \times 10^{-8}$.

$$\tan\theta = \theta + \frac{1}{3}\theta^3 + \frac{2}{15}\theta^5 + \frac{17}{315}\theta^7 + \frac{62}{2835}\theta^9 + \cdots$$

$$\tan\theta - \theta \simeq \frac{1}{3}\theta^3 = \frac{\Delta l}{2R}$$

$$\theta \simeq \left(\frac{3\Delta l}{2R}\right)^{1/3} = 0.00421716\ldots$$

$$h \simeq s = R\theta = 16.868 \text{ mi}$$

$$\Delta r = \frac{R}{\cos\theta} - R = R\left(1 + \frac{1}{2}\theta^2 - 1\right)$$

$$= (5000 \text{ mi})(8.8922\times 10^{-6}) =$$

$$= 0.044461 \text{ mi} = 177.8 \text{ ft}$$

$$(2 \text{ m})^{2/3} \rightarrow 605.5$$

$$\Delta r = \frac{\Delta l}{24} = \frac{12 \text{ in}}{(6)} = 2 \text{ in}$$

Gaussian $f(x) = e^{-\frac{x^2}{2}}$ 

$$I = \int_{-\infty}^{\infty} f(x)\,dx = \int_{-\infty}^{\infty} e^{-\frac{1}{2}x^2}\,dx = ??$$

$$I^2 = \int_{-\infty}^{\infty} f(x)\,dx \int_{-\infty}^{\infty} f(y)\,dy$$

$$= \int dx\,dy\; e^{-\frac{1}{2}x^2} e^{-\frac{1}{2}y^2} = \int dx\,dy\; e^{-\frac{1}{2}(x^2+y^2)}$$

$$(x,y) \to (r,\theta) = \int r\,dr\,d\theta\; e^{-\frac{1}{2}r^2}$$

$t = \frac{1}{2}r^2$ $\quad dt = r\,dr \Rightarrow (2\pi)\int_0^{\infty} dt\, e^{-t}$ $= 1$

$I^2 = 2\pi$ $\quad I = \sqrt{2\pi}$

$$\int_{-\infty}^{\infty} dx\; e^{-\frac{1}{2}\frac{x^2}{a^2}} = \sqrt{2\pi}\, a$$