

$$\vec{F}^4 = \begin{pmatrix} y_2^4 \\ 8/3 - y_1^4 \end{pmatrix} = \begin{pmatrix} 1.764856 \\ .971992 \end{pmatrix}$$

Correct a 5th time:

$$\vec{F}_r^4 = \frac{1}{3} \frac{7}{2^{11}} \begin{pmatrix} 1.764856 \\ .971992 \end{pmatrix} + \begin{pmatrix} 1.471068 \\ 1.643357 \end{pmatrix} =$$

$$\begin{pmatrix} 1.694675 \\ 1.764856 \end{pmatrix}$$

5th corrected
result, agrees
with 4th
corrected
result to
7 figures

Exact result:

$$y_1^4 = 2 \left(\frac{4}{3} \right) - 5 \sin^4 \frac{1}{3} = 1.694729$$

$$y_2^4 = 2 - \cos^4 \frac{1}{3} = 1.764762$$

$$\vec{F}_{true}^4 - \vec{F}_{corrector}^4 \approx \begin{pmatrix} 5 \times 10^{-5} \\ -9 \times 10^{-5} \end{pmatrix}$$