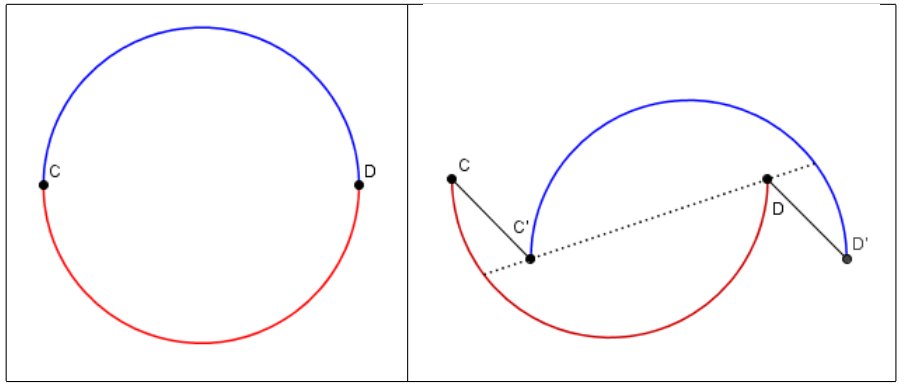# Problem 46

Consider the circle of radius 2 and horizontal diameter $\overline{CD}$. The upper semicircle is shifted right 1 unit and down 1 unit then $\overline{CC'}$ and $\overline{DD'}$ are drawn. Find the length of the longest line segment which lies within (inclusive) the figure.

Answer

$$\frac{7\sqrt{10}}{5}$$

Explanation

2*diam*cos(arctan(slope))-dist(C',D)

2*4*cos(arctan(1/3))-sqrt(10)

8*3/sqrt(10)-sqrt(10)

(24sqrt(10)-10sqrt(10))/10

14sqrt(10)/10

7sqrt(10)/5