

Calvin was making a trip to the University of Chicago. When he drove down, he took Lakeshore Drive, and averaged 35 miles per hour. On his way back, he took the I-94 highway, and averaged 50 miles per hour. Given that the return journey was 4 miles longer and took 6 minutes less, what is the length of the Lakeshore Drive route (in miles)?

Solution:

Let x be the length of the Lakeshore Drive route (in miles), so $x+4$ is the length of the I-94 highway route (in miles)

$x/35$ - time of a trip to the University of Chicago (in hours) and $(x+4)/50$ - time of return journey (in hours).

Finally we have the equation: $x/35 - (x+4)/50 = 0.1$ where $0.1(\text{hour})=6 \text{ min}$.

Then $50x - 35(x+4) = 50 \cdot 35 \cdot 0.1 \Rightarrow 15x = 315 \Rightarrow x=21$ (miles)

Answer: The length of the Lakeshore Drive route is 21 miles