This is a units problem:

Need: Angular speed of the Earth in radians per time unit.

You must choose your time units.

I chose seconds:

1 rev in: \((23 \text{ hrs})(\frac{3600 \text{ sec}}{\text{ hr}}) + (56 \text{ min})(\frac{60 \text{ sec}}{\text{ min}}) + 4 \text{ sec}\)

\[= 86,164 \text{ sec}.\]

\[\omega = \frac{2\pi \text{ rad}}{86,164 \text{ sec}} = \frac{\pi}{43,082} \text{ rad/sec}.\]

\[v = \omega r = \frac{\pi}{43,082} \cdot 3960 \text{ mi/sec.} \approx 0.289 \text{ mi/sec.}\]

Other possible answer

\[v = 17.3 \text{ mi/min.}\]

\[v = 1,040 \text{ mi/hr.}\]

Note: 2 sig. figs. is enough.