

GLE #20

A fan in the stands at a track meet uses his watch to time the 100 m dash. According to his measurement, the winner finishes the race in 12.22 seconds. The winner's official race time is 11.75 seconds. Based on the official race time, what is the fan's relative measurement error?

To find the relative measurement error, first find the absolute measurement error.

Absolute error = | official race time – measured race time |

Absolute error = | 11.75 s – 12.22 s |

Absolute error = 0.47 s

Next divide the absolute error by the true value to find the relative error.

Relative error = $\frac{\text{Absolute error}}{\text{Official race time}}$

Relative error = $\frac{0.47 \text{ s}}{11.75 \text{ s}} = 0.04$

Therefore, the relative measurement error is 0.04.