

Answer on Question 52213, Physics, Optics

Question:

Does your bathroom mirror show you older or younger than your actual age? Compute an order of magnitude estimate for the age difference, based on data that you specify.

Solution:

If you stand, for example, 40cm in front of the mirror, the time required for light scattered from your face to travel to the mirror and back to your eye is:

$$\Delta t = \frac{2d}{c} = \frac{2 \cdot 0.4\text{m}}{3 \cdot 10^8 \text{ m/s}} = 2.67 \cdot 10^{-9} \text{ s}.$$

Therefore, to the nearest order of magnitude, you look younger by 10^{-9}s .

Answer:

The image you observe shows you 10^{-9}s younger than your current age.