

NEXT-TIME QUESTION

An astronaut ages 3 years when traveling at 99% the speed of light to the star Procyon and back. The space officials to greet her on her return age

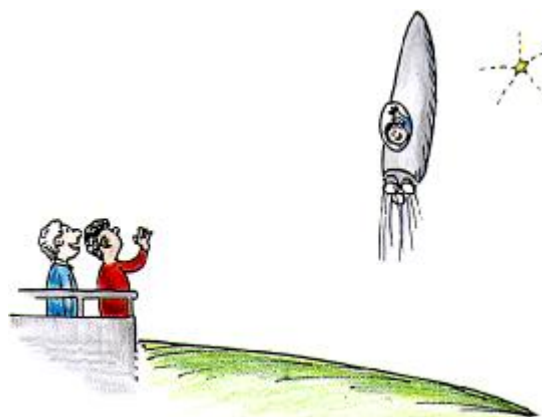
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Answer: c. more than 3 years

The 3 years experienced by the traveling astronaut is considerably less than if she had stayed at home. The stay-at-home age more than 3 years—21.2 years to be exact.

$$t = \frac{t_0}{\sqrt{1 - \left(\frac{v}{c}\right)^2}} = \frac{3 \text{ YR}}{\sqrt{1 - \left(\frac{0.99c}{c}\right)^2}} = \frac{3 \text{ YR}}{\sqrt{1 - 0.99^2}} = \frac{3 \text{ YR}}{\sqrt{0.02}} = 21.2 \text{ YR}$$

