

Relativistic Length Contraction Drills

- 1 A 4.0-m car parks in a garage with a proper length of 5.70 m but which seems to be 4.33 m. Calculate its speed as a percent of c .
- 2 An spaceship with a proper length of 213.10 m has a relativistic length of 40.25 m. Calculate its speed as a percent of c .
- 3 A spaceship is moving at $0.770c$. If its relativistic length is 227.27 m, calculate its proper length.
- 4 A muon passes through the Earth's atmosphere from a height of 12.30 km but which seems to be 8.70 km. Calculate its speed as a percent of c .
- 5 A 4.0-m car, parking in a garage with a proper length of 5.60 m, is moving at $0.862c$. Will it fit in the garage?
- 6 A muon, passing through the Earth's atmosphere from a height of 5.50 km, is moving at $0.902c$. How far does it seem to go?
- 7 A stick with a proper length of 0.60 m is moving at $0.732c$. Calculate its relativistic length.
- 8 A stick is moving at $0.614c$. If its relativistic length is 0.47 m, calculate its proper length.
- 9 A 4.0-m car parks in a garage with a proper length of 9.70 m but which seems to be 4.64 m. Calculate its speed as a percent of c .
- 10 An spaceship with a proper length of 381.20 m is moving at $0.901c$. Calculate its relativistic length.
- 11 A stick with a proper length of 1.60 m has a relativistic length of 0.61 m. Calculate its speed as a percent of c .
- 12 A 4.0-m car parks in a garage with a proper length of 9.80 m but which seems to be 4.08 m. Calculate its speed as a percent of c .
- 13 An spaceship with a proper length of 290.90 m is moving at $0.770c$. Calculate its relativistic length.

Answers:

1. $0.651c$ 2. $0.982c$ 3. 356.20 m 4. $0.707c$ 5. No, relativistic length is 2.84 m 6. 2.37 km 7. 0.41 m 8. 0.60 m 9. $0.878c$
10. 165.37 m 11. $0.925c$ 12. $0.909c$ 13. 185.61 m