

Relativistic Length Contraction Drills

- 1 An spaceship with a proper length of 433.20 m has a relativistic length of 251.02 m. Calculate its speed as a percent of c .
- 2 An spaceship with a proper length of 264.50 m has a relativistic length of 37.31 m. Calculate its speed as a percent of c .
- 3 A stick with a proper length of 1.90 m has a relativistic length of 0.80 m. Calculate its speed as a percent of c .
- 4 A muon passes through the Earth's atmosphere from a height of 15.50 km but which seems to be 11.46 km. Calculate its speed as a percent of c .
- 5 A stick with a proper length of 0.90 m is moving at $0.619c$. Calculate its relativistic length.
- 6 A spaceship is moving at $0.902c$. If its relativistic length is 117.39 m, calculate its proper length.
- 7 A muon is moving at $0.810c$. If it seems to pass through 4.22 km, what distance does someone on the ground see?
- 8 A stick is moving at $0.863c$. If its relativistic length is 0.25 m, calculate its proper length.
- 9 A muon, passing through the Earth's atmosphere from a height of 14.20 km, is moving at $0.674c$. How far does it seem to go?
- 10 A car is moving at $0.611c$. If the garage appears to be 7.36 m, calculate its proper length.
- 11 A stick is moving at $0.612c$. If its relativistic length is 0.71 m, calculate its proper length.
- 12 A 4.0-m car parks in a garage with a proper length of 7.70 m but which seems to be 5.80 m. Calculate its speed as a percent of c .
- 13 A car is moving at $0.643c$. If the garage appears to be 5.36 m, calculate its proper length.

Answers:

1. $0.815c$ 2. $0.990c$ 3. $0.907c$ 4. $0.673c$ 5. 0.71 m 6. 271.90 m 7. 7.20 km 8. 0.50 m 9. 10.49 km 10. 9.30 m 11. 0.90 m 12. $0.657c$ 13. 7.00 m