Relativistic Mass-Energy Drills

1 A muon with a rest mass of 1.884E-28 kg is moving at 0.677c. Calculate its relativistic mass.

2 A pion with a rest mass of 2.488E-28 kg has a relativistic mass of 3.197E-28 kg. What is its speed?

3 A pion has a rest mass of 2.488E-28 kg. Calculate its rest energy in joules and electron-volts.

4 An electron with a rest mass of 9.108E-31 kg is moving at 0.638c. Calculate its relativistic mass.

5 A pion with a rest mass of 2.488E-28 kg is moving at 0.982c. Calculate its kinetic energy in joules and electron-volts.

6 A proton with a rest mass of 1.672E-27 kg is moving at 0.863c. Calculate its total energy in joules and electron-volts.

7 A muon has a rest mass of 1.884E-28 kg. Calculate its rest energy in joules and electron-volts.

8 A neutron has a rest mass of 1.675E-27 kg. Calculate its rest energy in joules and electron-volts.

9 A kaon with a rest mass of 8.800E-28 kg has a relativistic mass of 2.500E-27 kg. What is its speed?

10 A proton with 2.401E-10 J total energy is moving at 0.779c. What is its rest mass?

11 A neutron with a rest mass of 1.675E-27 kg is moving at 0.643c. Calculate its total energy in joules and electron-volts.

12 A proton with 3.287E-10 J total energy is moving at 0.889c. What is its rest mass?

13 A pion with a rest mass of 2.488E-28 kg is moving at 0.692c. Calculate its relativistic mass.

1E-8 = 1 x 10^(-8)

Answers:

1. 2.56E-28 kg 2. 0.628c 3. 2.24E-11 J, 1.40E08 eV 4. 1.18E-30 kg 5. 9.62E-11 J, 6.01E08 eV 6. 2.98E-10 J, 1.86E09 eV 7. 1.70E-11 J, 1.06E08 eV 8. 1.51E-10 J, 9.42E08 eV 9. 0.936c 10. 1.67E-27 kg 11. 1.97E-10 J, 1.23E09 eV 12. 1.67E-27 kg 13. 3.45E-28 kg