Relativistic Mass-Energy Drills

1 A muon with a rest mass of 1.884E-28 kg is moving at 0.645c. Calculate its kinetic energy in joules and electron-volts.

2 A pion with a rest mass of 2.488E-28 kg is moving at 0.674c. Calculate its relativistic mass.

3 A pion with a rest mass of 2.488E-28 kg has a relativistic mass of 6.002E-28 kg. What is its speed?

4 A pion with a rest mass of 2.488E-28 kg is moving at 0.887c. Calculate its kinetic energy in joules and electron-volts.

5 An electron with a rest mass of 9.108E-31 kg has a relativistic mass of 1.233E-30 kg. What is its speed?

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

7 A proton with a rest mass of 1.672E-27 kg is moving at 0.673c. Calculate its kinetic energy in joules and electron-volts.

8 A pion with 3.615E-11 J total energy is moving at 0.785c. What is its rest mass?

9 A neutron with a rest mass of 1.675E-27 kg has a relativistic mass of 2.502E-27 kg. What is its speed?

10 A kaon with 1.522E-10 J total energy is moving at 0.854c. What is its rest mass?

11 A neutron with a rest mass of 1.675E-27 kg is moving at 0.907c. Calculate its total energy in joules and electron-volts.

12 A pion with a rest mass of 2.488E-28 kg has a relativistic mass of 1.355E-27 kg. What is its speed?

13 A proton has a rest mass of 1.672E-27 kg. Calculate its rest energy in joules and electron-volts.

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

Answers:

1. 5.23E-12 J, 3.27E07 eV 2. 3.37E-28 kg 3. 0.91c 4. 2.61E-11 J, 1.63E08 eV 5. 0.674c 6. 1.70E-11 J, 1.06E08 eV 7. 5.30E-11 J, 3.31E08 eV 8. 2.49E-28 kg 9. 0.743c 10. 8.80E-28 kg 11. 3.58E-10 J, 2.24E09 eV 12. 0.983c 13. 1.51E-10 J, 9.41E08 eV