

Looking at the Lorentz transformations for momentum p and energy E which of the expressions below is a Lorentz invariant?

A) $E^2 - (c^2m)^2$

B) $E^2 - p^2$

C) $(cE)^2 - p^2$

D) $p^2 - (cm)^2$

E) $E^2 - (cp)^2$


Looking at the Lorentz transformations for momentum p and energy E which of the expressions below is a Lorentz invariant?

A) $E^2 - (c^2m)^2$

B) $E^2 - p^2$

C) $(cE)^2 - p^2$

D) $p^2 - (cm)^2$

 E) $E^2 - (cp)^2$

E is like t and p is like x in our formula for s^2
check units to figure out whether its B, C or E

A bullet strikes a motionless car, weighting 2000kg.
After the bullet sticks in the car, the car is found to be moving
with velocity 1000m/s and is 8.33g heavier than it was before.
How much did the bullet weigh?

Hint: 1000m/s is not a relativistic speed!

This might help: $(1000\text{m/s}) \cdot (2000\text{kg}) / c = 6.67\text{g}$

A) 8.33 g

B) 5 g

C) 6.67 g

D) 1.66 g

E) 15 g

A bullet strikes a motionless car, weighting 2000kg.
After the bullet sticks in the car, the car is found to be moving
with velocity 1000m/s and is 8.33g heavier than it was before.
How much did the bullet weigh?

Hint: 1000m/s is not a relativistic speed!

This might help: $(1000\text{m/s}) \cdot (2000\text{kg}) / c = 6.67\text{g}$

A) 8.33 g

B) 5 g

C) 6.67 g

D) 1.66 g

E) 15 g