Exam #1

1) Chased by a comet *(4 points)*

a)

b)

c)

d)

e)

2) Chased by a photon *(4 points)*

a)

b)

c)

d)

2) Strong Box *(4 points)*

a)

b)

c)

d)

3) Bomb *(8 points)*

Which of the following are invariant (ie: agreed on by all inertial observers)?

a) mass

c)

b) component of the velocity of a projectile perpendicular to relative direction of motion

c) time between events

d) distance between events

e) total particle speed when beta < 1

f) total particle speed when beta = 1

g) proper time along a world line

X) Mass *(Y points)*

Consider three particles A, B, C. Particle A has 10 GeV of total energy and is moving at $\beta = \frac{3}{5}$. Particle B has 8 GeV of total energy and 2 GeV of momentum. Particle C has 12 GeV of total energy and 3 GeV of kinetic energy. Which particle is the most massive ? Which is the least massive?

Something with neclear decays