Answer on Question #41067, Mechanics | Kinematics | Dynamics

Question:

IF THE TOTAL ENERGY OF THE PARTICLE IS EXACTLY TWICE OF ITS REST ENERGY THEN ITS SPEED IN TERMS OF THE SPEED OF LIGHT C IS

Answer:

Total energy of the particle equals:

$$E = \frac{m_0 c^2}{\sqrt{1-\beta^2}}$$

where c is speed of light, m_0 is rest mass of particle, $\beta$is speed in terms the speed of light.

Rest energy equals:

$$E_0 = m_0 c^2$$

Therefore:

$$E = 2E_0$$

$$\frac{m_0 c^2}{\sqrt{1-\beta^2}} = 2m_0 c^2$$

$$\sqrt{1-\beta^2} = \frac{1}{2}$$

$$\beta = \sqrt{1-\frac{1}{4}} = \frac{\sqrt{3}}{2}$$

Answer: $\frac{\sqrt{3}}{2}$