

PROBLEM 11.23 (Continued)

1. $\frac{1}{2}mv^2 = \frac{1}{2}m_0c^2(\gamma - 1)$

2. $\frac{1}{2}m_0c^2(\gamma - 1) = \frac{1}{2}m_0c^2\left(\frac{1}{\sqrt{1 - \beta^2}} - 1\right)$

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

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

5. $\frac{1}{\sqrt{1 - \beta^2}} = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$

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

7. $1 - \beta^2 = \frac{1}{\gamma^2}$

8. $1 - \frac{v^2}{c^2} = \frac{1}{\gamma^2}$

9. $1 - \frac{v^2}{c^2} = \frac{1}{\left(\frac{1}{\sqrt{1 - \beta^2}}\right)^2}$

10. $1 - \frac{v^2}{c^2} = 1 - \beta^2$

11. $1 - \frac{v^2}{c^2} = 1 - \frac{v^2}{c^2}$

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