

4. We will write the speed of 1% the speed of light as 0.01 c in the expression for γ .

$$\gamma = (1 - v^2 / c^2)^{-1/2}$$

$$\gamma = [1 - (0.01 c)^2 / c^2]^{-1/2}$$

$$\gamma = [1 - (0.01)^2]^{-1/2} = 1 / [1 - 0.0001]^{1/2}$$

$$\gamma = 1 / (0.9999)^{1/2} = 1 / 0.99995$$

$$\gamma = 1.00005$$

This indicates that even for a speed of 1 % the speed of light the differences between the predictions of special relativity and those of classical mechanics do not differ by much, only by 0.005 %. A speed of 1 % the speed of light is 3×10^6 m / s. This is a very large speed, equivalent to 6.7 million miles per hour!