

Answer on Question 65768, Physics, Mechanics, Relativity

Question:

N'dea, an ACCESS student, has a mass of 87.5 kg . Her new bicycle has a mass of 14.6 kg . N'dea is pedaling so that a net (unbalanced) force of 7.87 N accelerates her and her bicycle. What is the value of the acceleration?

Solution:

By the definition of the Newton's Second Law of Motion we have:

$$F_{net} = (M + m)a,$$

here, M is the mass of N'dea, m is the mass of the bicycle, F_{net} is the net force acting on the N'dea and her bicycle, a is the acceleration.

Then, from this formula we can find the value of the acceleration:

$$a = \frac{F_{net}}{(M + m)} = \frac{7.87 \text{ N}}{(87.5 \text{ kg} + 14.6 \text{ kg})} = 0.077 \frac{\text{m}}{\text{s}^2}.$$

Answer:

$$a = 0.077 \frac{\text{m}}{\text{s}^2}.$$

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