Answer on Question #43602, Physics, Mechanics | Kinematics | Dynamics

Question:

Calculate the force needed to accelerate a 50-kg boy at a rate of 10 m/s2

Answer:

Newton's second law of motion:

The acceleration of a body is directly proportional to, and in the same direction as, the net force acting on the body, and inversely proportional to its mass:

$$a = \frac{F}{m}$$

Therefore, the force needed to accelerate a 50-kg boy at a rate of 10 m/s2 equals:

$$F = ma = 50kg \cdot 10\frac{m}{s^2} = 500\ N$$

Answer: $500\ N$