Question: 6.2 Newton's second law can be stated in this way: the force i...

1. **6.2** Newton's second law can be stated in this way: the force is equal to the rate of change of momentum, $F = d(mv)/dt$. Taking the derivative by parts yields $F = m(dv/dt) + v(dm/dt)$. This does not correspond to $F = ma$. What is the source of the discrepancy?

Expert Answer

Anonymous answered this
3,467 answers

We use a special case in the definition of force,in which mass=constant.Only with constant mass,we can use this formula, F=ma.

Force = Rate of change in momentum

$$= \frac{dp}{dt} = \frac{d}{dt}(m \times v)$$

$$= v\left(\frac{dm}{dt}\right) + m\left(\frac{dv}{dt}\right)$$

$$F = v\left(\frac{dm}{dt}\right) + ma \quad \text{— (1)}$$

The reason of this discrepency is, since mass = constant (in some specical cases like rocket fuel)

So, $\frac{dm}{dt} = 0$ [For m = Constant]

Now Equation (1) becomes.

$$F = V \times 0 + ma \Rightarrow \boxed{F = ma}$$

We must keep in mind, this formula is only valid if mass is Constant not variable.

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negligible mass, and both it
and the inclined plane are frictionless. Block A has a mass of 1.0 kg, block B has a

See answer

M is sitting at equilibrium on

See answer

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Q: Which of the following statements (A-C) is not true given, 2D + E -> 3A + B + 2C and rate = k[A][B]? a. The reaction is 2nd order overall b. The reaction is zeroth order with respect to C c. The reaction is first order with respect to A and first order with respect to B d. all statements are true

A: See answer 100% (1 rating)

Q: Determine the external reactions in the x and y directions needed to hold this fixed vane, which turns the oil jet in a horizontal plane. Here V_1 is 18 m/s, V_2 = 17 m/s, and = 0.15 m^3/s.

A: See answer 100% (10 ratings)

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