Mastering Physics Solutions Chapter 5 Newton's Laws Of Motion

https://www.aplustopper.com/mastering-physics-solutions-chapter-5-newtons-laws-of-motion/
http://bit.ly/2xIZfp4
https://docs.google.com/document/d/e/2PACX-1vRwW4EvDbmqwdlWjwOBPfU3KzhsbozOm79DJ_b0lWyvGw7VCWHys5wE1WOXMt4QYAuIvG7_zak5mkHj/pub
http://bit.ly/2swHjZJ
https://docs.google.com/presentation/d/e/2PACX-1vSXTIYDKljvWIGcyhc2jFhPKLLY-tSGe5u9oivrVPKQnOQnVqfnWhqdCtOK9dfmIcfFVTNc2deLXW5c/pub?start=false&loop=false&delayms=3000
http://bit.ly/2xFeE9Y
https://sites.google.com/site/aplustoppernotes/mastering-physics-solutions-chapter-5-newton-s-laws-of-motion
http://bit.ly/2LoHfSO
http://aplustoppernotes.blogspot.com/2018/06/mastering-physics-solutions-chapter-5.html
http://bit.ly/2Jifw5Q
https://aplustoppernotes.wordpress.com/2018/06/05/mastering-physics-solutions-chapter-5-newtons-laws-of-motion/
http://bit.ly/2HkQ2mG
https://wp.me/p9YiSz-X

Chapter 5 Newton's Laws Of Motion Q.1CQ
Driving down the road, you hit the brakes suddenly. As a result, your body moves toward the front of the car. Explain, using Newton's laws.
Solution:
When the brakes are applied, the car slows down. The body, however, keeps moving at the same speed. Thus, because of inertia, the body moves toward the front of the car.

Let *m* represent the mass of the object

Initial speed of the object $v_0 = 0$

Let *v* represent the final speed of the object

Let *T* represent the time during which the force acts on the object

Let *F* represent the force acting on the object

Acceleration of the object $a = \frac{v - v_0}{T}$

$= \frac{v}{T}$

However, force on the object $F = ma$

$= \frac{mv}{T}$

$T = \frac{mv}{F}$

If the mass of the object is doubled, and the force acting on it is quadrupled, then

$T' = \frac{(2m)v}{4F}$

$= \frac{mv}{2F}$

$= \frac{T}{2}$

The time taken by the object to accelerate from rest to speed *v* is $\boxed{\text{halved}}$.