Seat belts and air bags save lives by reducing the forces exerted on the driver and passengers in an automobile collision. Cars are designed with a "crumple zone" in the front of the car. In the event of an impact, the passenger compartment decelerates over a distance of about 1 m as the front of the car crumples. An occupant restrained by seat belts and air bags decelerates with the car. By contrast, an unrestrained occupant keeps moving forward with no loss of speed (Newton's first law!) until hitting the dashboard or windshield. These are unyielding surfaces, and the unfortunate occupant then decelerates over a distance of only about 5 mm . Part APart complete A 60 kg person is in a head-on collision. The car's speed at impact is 15 m/s . Estimate the net force on the person if he or she is wearing a seat belt and if the air bag deploys.

Answer:

The net force is 1350 kN

Solution:

As per the question:

Mass of man, m = 60 kg

Initial speed of the car, v = 15 m/s

Final speed of the car, v' = 0 m/s

Distance covered by the person before coming to rest, d = 5 mm =

By using the third eqn of motion:

Thus the force on the person can be given by:

F = ma =

You are trying to decide whether you should go to college. To help decide, you compare what you would sacrifice to go to college with the higher earnings you will generate with a college degree. The analysis you have just conducted is called _____.
Kanha is a student at purdue university who recently got his first f. now he has to make a decision about how to get his grades back up. having recently taken a class on decision making, kanha decides to follow the six-step process for deciding what to do. what problem is kanha most likely to face during the implementation of chosen alternative step in the decision-making process?
The two orbital elements that determine the size and shape of a planetary orbit are: planet's equatorial diameter and rotation rate tilt of the planet's axis and orbital period planet's orbital eccentricity and semi-major axis planet's speed and inclination
What are the six types of families ?
the difference between the heights of your chair and your desk is -10 1/4 inches. the height of your desk is 29 3/4 inches. what is the height of your chair?
What leaders and groups disagreed about the french revolution
The ratio of the areas of two similar polygons is 400:25. what is the ratio of their corresponding sides
A table has an area of 12 feet squared and a perimeter of 16 ft. What are the dimensions of the table? A. 2 ft by 6 ft
B. 2 ft by 8 ft
C. 4 ft by 3 ft
D. 4 ft by 4 ft
A company that has little competition is called ?
Stars, such as our sun, use fusion to combine hydrogen atoms into helium atoms, and in the process, create energy. As massive stars use the last of their helium fuel, they begin to collapse and temperatures climb high enough to fuse other heavier elements. As elements increase in atomic number, the amount of energy required for fusion to occur also increases. Nickel represents the heaviest element that can be produced by fusion due to to the net energy requirements. Two atoms of _____ could combine by fusion in order to create nickel. A) hydrogen
B) nitrogen
C) oxygen

D) silicon

Scientists use the emission spectra of elements to detect
A) explosives in luggage.
B) cracks in support structures, like bridges.
C) the possibility of an earthquake occurrence.
D) elements in clouds of gas and dust in deep space

Vanadium has two naturally occuring isotopes - vanadium-50 and vanadium-51. Predict the isotopic mass of vanadium-50 given that vanadium-50 has an abundance of 0.250% and that vanadium-51 has an abundance of 99.750% and a mass of 50.944 amu.
A) 49.944 amu
B) 62.558 amu
C) 63.303 amu
D) 5094.151 amu
List 3 ways taoism impacted chinese culture and values
What was the significance of the Bronze Age?
One way the body fights invaders is by increasing the body temperature, or running a fever. Give a brief explanation as to why that defensive technique works against some viruses or bacteria. This is a writing assignment!
Why isn't a higher concentration of disinfectant used to clean contact lenses?
Samuel: ¿Dónde _____ el abuelo Agustín? A. nacieron B. nacimos C. naciste D. nací E. nació
Why did coal not form in australia, while it did form on other continents?
The neck length was recorded for 5 different giraffes.each measurement has been rounded to the nearest 1/2 foot .measuments:5 4 1/2 6 5 6 1/2 . How much longer are the two longest necks than the two shortest necks?
Jack always drank soda whenever he hung out with his friends. On one particular occasion, Jack didn't have any soda to drink and as soon as he saw his friends, he became thirsty. Jacks friends represent the: Group of answer choices Unconditioned Response Conditioned Stimulus Unconditioned Stimulus Conditioned Response

1. Home
2. More Solution