

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 A Part 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, $v = 15 \text{ m/s}$

Final speed of the car, $v' = 0 \text{ m/s}$

Distance covered by the person before coming to rest, $d = 5 \text{ mm} =$

By using the third eqn of motion:

Thus the force on the person can be given by:

$F = ma =$

One hundred percent of the scores in a normal distribution fall within plus or minus two standard deviations of the mean.

Match the following term with its correct definition

- 1 compression waves caused by movements in the earth's crust and radiate outward from the source of an earthquake

- 2 the location on the surface of the earth directly above the focus of an earthquake

- 3 the zone within the earth where rock displacement produces an earthquake

- 4 a break in the lithosphere along which bodies of rock can move

and the options:

A Fault

B Focus

C Seismic waves

D Epicenter

which best identifies an effect of the use of first person point of view in the story gumption? A. it helps the reader to invest in the main character, Sylvester. B it

allows the reader to understand all of the character's thoughts. C. It creates a feeling of objective for the reader. D it reveals the story's theme

Which of these statements about citizenship is true? A citizen must attend public school and speak English.

To be a U.S. citizen, you must be born in the U.S. or a U.S. territory.

A naturalized citizen must swear allegiance to the U.S. government.

A citizen must serve in the military to have full citizenship.

What is the equation of a line that has a slope of 3 and a y-intercept of -3

On Wednesday melissa packs only two notebooks and binder into her backpack . How much does her full backpack weigh on Wednesday. Two notebooks 11oz
binder 2lb 5oz

What important principle did the Magna Carta represent that later influence the u.s constitution

Maxwell and Jim have resided together for several years but are not married. Maxwell is concerned that if he dies first, his family may contest the transfer of his assets to Jim through his will so he wants to avoid any transfers through his will. Of the following options, which transfer arrangements would ensure that Maxwell's assets will be transferred to Jim at Maxwell's death?

The average person living in Argentina

What is an expression equivalent to $-3.5(2n-3n)-2.5n$?

Find the direct variation equation of the graph through the points (0, 0) and (1, -2). Write in $y=kx$ form. A. $y = 2x$

B. $y = -2x$

C. $y = 1/2 x$

D. $y = -1/2 x$

Find the direct variation equation which passes through (0, 0) and (4, 1).

A. $y = 4x$

B. $y = -4x$

C. $y = 1/4 x$

D. $y = -1/4 x$

What comes after $3/4$ on a number line

Which of these steps is second in the lawmaking process? A.The bill is sent to the president.

B. The bill is introduced in Congress.

C. The president signs or vetoes the bill.

D. The bill passes in both houses.

What are some advantages and disadvantages of having an exoskeleton?

Paul has a white and blue shirt he also has two trousers of brown and black how many different outfits

Which country launched the Mir Space Station? United States

Russia

China

Germany

What is the selective service system

In the study that the FBI did on examining the physical characteristics of hair, what percentage of the “matches” were not really matches at all? One percent Ten percent Thirty percent Forty percent

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