

PQ 6c

Questions

Q1

The initial velocity of a car moving on a straight road is 2.0 m s^{-1} and becomes 8.0 m s^{-1} after travelling for 2.0 s under constant acceleration. What is the acceleration?

Q2

A plane starting from rest takes 15.0 s to take off after speeding over a distance of 450.0 m on the runway with constant acceleration. With what velocity does it take off?

Q3

The acceleration of a car is assumed constant at 1.5 m s^{-2} . How long will it take the car to accelerate from 5.0 m s^{-1} to 11 m s^{-1} ?

Q4

A car accelerates from rest to 28 m s^{-1} in 9.0 s . What distance does it travel?

Q5

A body has an initial velocity of 12 m s^{-1} and is brought to rest over a distance of 45 m.

What is the acceleration of the body?

Q6

A body has an initial velocity of 3.0 m s^{-1} and after travelling 24 m the velocity becomes 13 m s^{-1} . How long did this take?

Q7

What deceleration does a passenger of a car experience if his car, which is moving at 100.0 km h^{-1} , hits a wall and is brought to rest in 0.100 s ? Express the answer in m s^{-2} .

Q8

A car is travelling at 40.0 m s^{-1} . The driver sees an emergency ahead and 0.50 s later slams on the brakes. The acceleration of the car is -4 m s^{-2} .

- What distance will the car travel before it stops?
- If the driver was able to apply the brakes instantaneously without a reaction time, over what distance would the car stop?
- Calculate the difference in your answers to (a) and (b).
- Assume now that the car was travelling at 30.0 m s^{-1} instead. Without performing any calculations, would the answer to (c) now be less than, equal to or larger than before? Explain your answer.

Q9

A ball is thrown upwards with a speed of 24.0 m s^{-1} .

- (a) When is the velocity of the ball 12.0 m s^{-1} ?
- (b) When is the velocity of the ball -12.0 m s^{-1} ?
- (c) What is the displacement of the ball at those times?
- (d) What is the velocity of the ball 1.50 s after launch?
- (e) What is the maximum height reached by the ball?

(Take the acceleration due to gravity to be 10.0 m s^{-2} .)