

Q1.(2020)

a)

B to D

b)

metre rule

c)

**so that each piece falls the
same distance**

d)

$$\frac{34 + 37 + 34}{3}$$

35 (s)

e)

cone

the (mean) time is the lowest

f)

Time through air would be less.

g)

$$w = 0.050 \times 9.8$$

$$w = 0.49 \text{ (N)}$$

h)

Electrostatic force

Magnetic force

Q2.(2020)

a)

velocity includes direction

b)

(an equal) force from the air
pushes on the engine/aircraft

in the opposite direction

c)

correct value for distance and
corresponding time
(eg 12 000 m and 50 s)

$$v = \frac{\text{their change in distance}}{\text{their change in time}}$$

$$\text{speed} = 240 \text{ (m/s)}$$

d)

$$\begin{array}{l} \text{acceleration} = \\ \frac{\text{change in velocity}}{\text{time taken}} \end{array} \quad \text{or} \quad a = \frac{\Delta v}{t}$$

e)

$$250 - 68 = 182$$

$$0.14 = \frac{182}{t}$$

$$t = \frac{182}{0.14}$$

$$t = 1300 \text{ (seconds)}$$

Subtopic: Distance, displacement, speed and velocity

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f)

work done = force $\times$ distance

or

$$W = F s$$

g)

$$140\,000\,000 = \text{force} \times 2000$$

$$\text{force} = \frac{140\,000\,000}{2000}$$

$$\text{force} = 70\,000 \text{ (newtons)}$$

Q3.(2022)

a)

distance (travelled) = speed $\times$
time

or

$$s = vt$$

b)

$$13.2 = 330 \times t$$

$$t = \frac{13.2}{330}$$

$$t = 0.04 \text{ (s)}$$

c)

loudspeaker **B** is further from
the technician (than speaker **A**)

so the sound would take more
time to travel (to the technician)

so the sound from each speaker
arrives at the technician at the
same time

Q4.(2023)

a)

7.1 (cm)

497 (m)

b)

0 (N)

c)

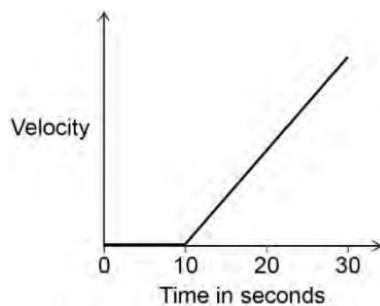
constant velocity

d)

any **one** from:

- tension
- normal contact (force)
- upthrust

e)



f)

line of best fit drawn and
extrapolated to 10 km

28 (kPa)

g)

the average density of the air
above the aeroplane decreases

Q5.(2024)

a)

distance

speed

b)

3200 (m)

c)

$$\begin{aligned}\text{average speed} &= \frac{3200}{2000} \\ &= 1.6 \text{ (m/s)}\end{aligned}$$

d)

B

It has the smallest gradient

e)

gravity

f)

3.0 m/s