

Graphs of Motion Test

Naam: _____

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QUESTION 1:

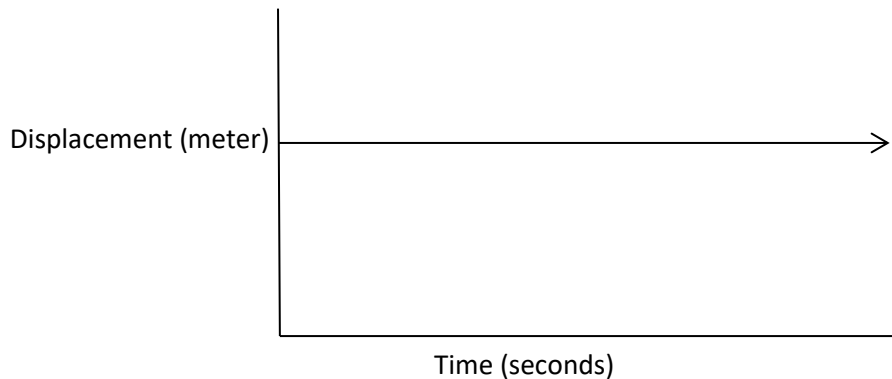
1.1) A ball is thrown from a high building. Ignore all effects of air resistance. What description is the most accurate for the ball's velocity for the whole movement?

- A.) The velocity decreases and the ball stops and then the velocity increases as it falls.
 - B.) The velocity only increases.
 - C.) The velocity does not change and remains constant.
 - D.) No change
- (2)

1.2) The area under a velocity-time graph represents:

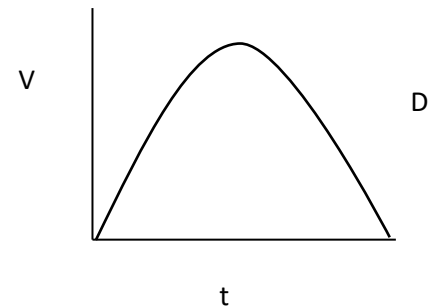
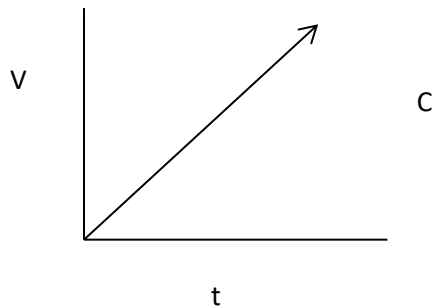
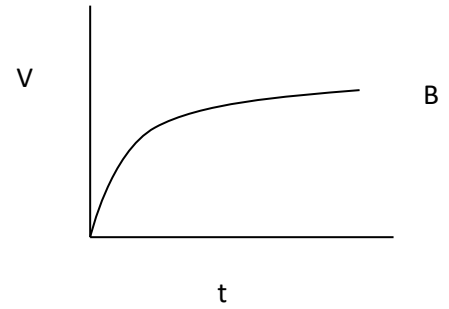
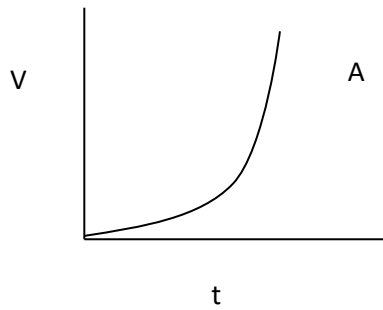
- A.) Distance.
 - B.) Displacement.
 - C.) Acceleration.
 - D.) Velocity
- (2)

1.3) What conclusion can be made after studying the following graph?



- A.) Constant velocity for the object.
 - B.) Velocity decreases.
 - C.) Velocity is zero
 - D.) A and C.
- (2)

1.4) Which motorcar has travelled the longest distance?



- A.) Motorcar A.
- B.) Motorcar B.
- C.) Motorcar C.
- D.) Motorcar D.

(2)

1.5) What is represented by the following slope : $\frac{\Delta x}{\Delta t}$.

- A.) Velocity
- B.) Acceleration
- C.) Position
- D.) None of the above

(2)

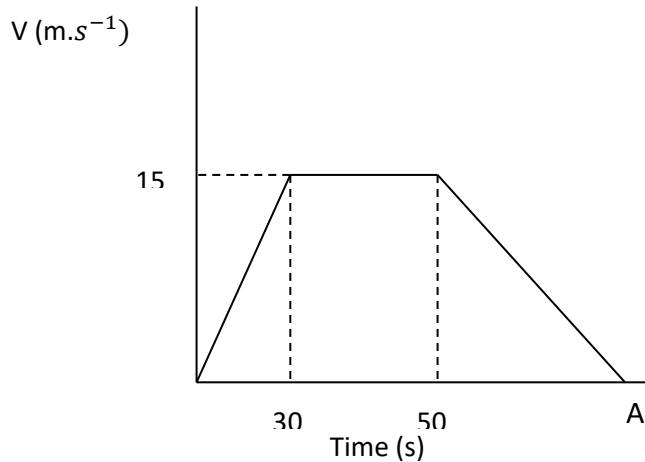
Memorandum

QUESTION 1:

- 1.1) A.
- 1.2) C.
- 1.3) D.
- 1.4) A.
- 1.5) A.

QUESTION 2:

2.1) The following graph represents a motorcar's velocity over a period of 50s. The motorcar initially moved out of a stationary position.



2.2) Calculate the rate in change of velocity for the first 30 seconds. (3)

2.3) Use calculations and determine if the motor car will travel 525m. (5)

Memorandum

QUESTION 2:

2.2) Acceleration = slope from $t=0$ tot $t=30\text{s} = \frac{\Delta V}{\Delta t} = \frac{15}{30} = 0,5 \text{ m.s}^{-2}$. (3)

2.3)

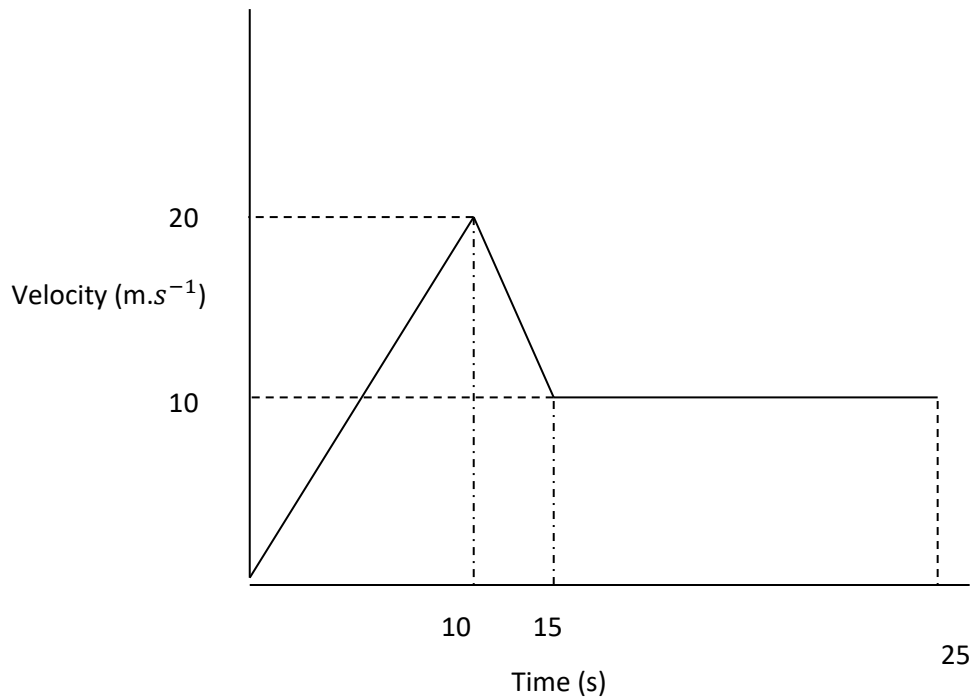
Displacement = Area

1st Area (Triangle) = $\frac{1}{2} b h = \frac{1}{2} (15)(30) = 225\text{m}$.

2nd Area (Square) = $l.b = (15)(20) = 300\text{m}$.

Totale distance = 525m . The car will travel 525m. (5)

QUESTION 3:



The graph shows how a driver is accelerating for the first 10 seconds. The driver puts his foot on the break to slow down as illustrated.

- 3.1) How far did the car travel after 25 seconds? (5)
- 3.2) What is the motorcar's change in velocity after 25s? (3)
- 3.3) Calculate the acceleration for the first 10 seconds. (2)

QUESTION 3:

3.1)

$$\begin{aligned} 10\text{s: Displacement} &= \text{area}(t=0 \text{ tot } t=10\text{s}) \\ &= \frac{1}{2}bh \\ &= \frac{1}{2}(200)(2)=100\text{m.} \end{aligned}$$

$$\begin{aligned} 15\text{s: Displacement} &= \text{area}(t=10 \text{ tot } t=15\text{s}) \\ &= \frac{1}{2}bh \\ &= \frac{1}{2}(5)(10) \\ &= 25\text{m.} \end{aligned}$$

$$\begin{aligned}
 25\text{s: Displacement} &= \text{area}(t=15 \text{ tot } t=25) \\
 &= l.b \\
 &= (10)(10) \\
 &= 100 \text{ m.}
 \end{aligned}$$

Totale Distance : 225m. (5)

$$\begin{aligned}
 3.2) \Delta V &= V_f - V_i \\
 &= (10 - 20) \\
 &= -10 \text{ m.s}^{-1}
 \end{aligned}$$

thus 10m.s^{-1} in the opposite direction. (3)

3.3) Acceleration for first 10s:

$$\begin{aligned}
 a &= \text{slope } (t=0 \text{ tot } t=10\text{s}) \\
 &= \frac{\Delta v}{\Delta t} = 20/10 = 2\text{m.s}^{-2}.
 \end{aligned}
 \quad (3)$$