أ. ريم بنت عائض الردادي

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MS. c: Plasma Physics

Text Book: PHYSICS BY KANE & STERNHEIM (3TH EDITION)

Physics for Scientists and Engineers with Modern Physics
BY: Serway and jewett (6th Edition)

علم القياس

النظام System	الطول length	المساحة Area	الحجم Volume	السرعة Velocity	التسارع acceleration
الدولي (SI)	m	m^2	m^3	m/s	m/s^2
cgs	cm^2	cm^3	cm^3	cm/s	cm/s^2

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Chapter (1)
Motion in a Straight Line

1.2 Displacement; average velocity

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A car travels in a straight line at 40 Km/h for 1h and at 60 km/h for 2h.

(a)How far does it travel?

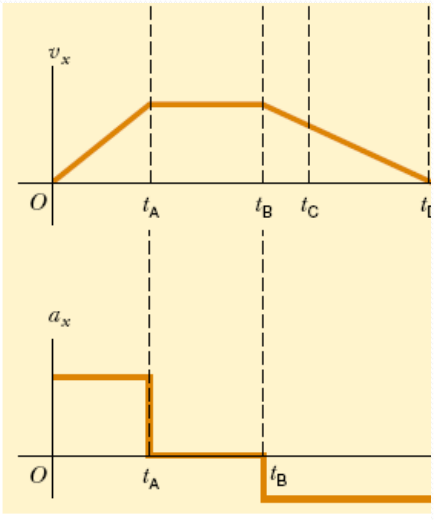
(b)Find the average velocity?

Chapter (1)
Motion in a Straight Line

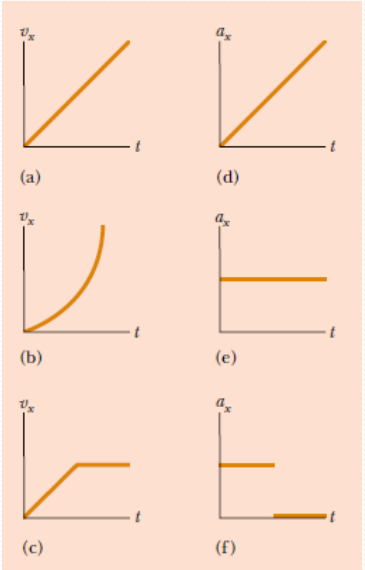
1.2 Displacement; average velocity

1.4 Acceleration

Average acceleration
Instantaneous acceleration



Match each v-t graph on the left with the a-t graph on the right that best describes the motion?



The velocity of a particle moving along the x axis varies in time according to expression $V= (40-5t^2)$ m/sec, where t is in seconds?

(a) Find the average acceleration in the time interval t=0 to t=2sec?

(b) Determine the acceleration at t=2 sec?

The speed of an automobile moving an a straight road is given in meters per seconds as a function of time t in seconds by the following equation:

$$V=4+2t^3$$

What is the acceleration of the automobile at t=2sec?

Chapter (1)
Motion in a Straight Line

- ✓ **1.2 Displacement; average velocity**
- ✓ **1.4 Acceleration**
- **1.5 Finding the motion of an object.**

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Kinematic Equations for Motion of a Particle Under Constant Acceleration

$$(1)\ V_f = V_i + a\,t \qquad (4)\ \Delta x = V_i\,t + \frac{1}{2}a\,t^2$$

$$(2)\ V = \frac{V_i + V_f}{2} \qquad (5)\ V_f^2 = V_i^2 + 2\,a\,\Delta x$$

$$(3)\ x_f = x_i + \frac{1}{2}(V_i + V_f)t$$

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Kinematic Equations for Motion of a Particle Under Constant Acceleration

Equation	Information Given by Equation
$v_{xf} = v_{xi} + a_x t$	Velocity as a function of time
$x_f = x_i + \frac{1}{2}(v_{xi} + v_{xf})t$	Position as a function of velocity and time
$x_f = x_i + v_{xi}t + \frac{1}{2}a_x t^2$	Position as a function of time
$v_{xf}^2 = v_{xi}^2 + 2a_x(x_f - x_i)$	Velocity as a function of position

Note: Motion is along the x axis.

A truck covers 40.0 m in 8.50 s while smoothly slowing down to a final speed of 2.80 m/s. (a) Find its original speed.