1-18-2008

PHYSICS AND ASTRONOMY
Spring 2008

DEPARTMENTAL TUTORING SESSIONS

Nielsen Hall RM 257

Harshadewa Gunawardana

Monday, 4:00pm-9:00pm, Wednesday, 4:00pm-9:00pm & Friday, 7:30am-9:30am

---

CURRENT TUTORS FOR PRIVATE SESSIONS, Spring 2008

The following students are qualified tutors endorsed by the Department of Physics/Astronomy. Fees are negotiated between students and tutors prior to services rendered.

	Cell	Home	Office
Jeff Crawford contact instructor for location E-mail: jcrawford@ou.edu Phys 1114, 2414, 2424, 2514, 2524			
Mark Curtis contact instructor for location E-mail: Mark.E.Curtis-1@ou.edu Phys 1114, 2414, 2424, 2514, 2524	(405)292-0676		325-3961 ext 36405
Juliette Dalhed contact instructor for location E-mail: jtrupert@ou.edu Phys 1114, 2414, 2424, 2514, 2524	(405)200-9188		325-3961 ext 36406
Parshuram Dahal contact instructor for location E-mail: pdahal@ou.edu Phys 1114, 2414, 2424, 2514, 2524	(405)740-4790		325-3961 ext 36148
Jeremy Jernigen contact instructor for location E-mail: Jernigen@nhn.ou.edu Phys 1114. 2414, 2424, 2514, 2524	(405)924-3874		
Ernie Sanchez contact instructor for location E-mail: Ernest.S.Sanchez-1@ou.edu Phys 1114, 2414, 2424, 2514, 2524	(405)812-0448		
Chris Allen contact instructor for location E-mail: ComradeChris@gmail.com Phys 1114, 2414, 2424, 2514, 2524	(405)370-6632		
David Kelle contact instructor for location E-mail:davidkelle@gmail.com Phys 1114, 2414, 2424, 2514, 2524	(580)716-1859		

During the course of the semester, additional names may be added to the list of private tutors.
Current lists are always available in the Physics and Astronomy Office, Nielsen Hall, room 100.
To contact all tutors listed above, please email an inquiry to tutors@nhn.ou.edu

- Read 2.5-2.6

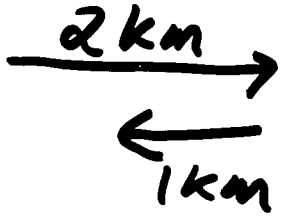
- H.w Due Tonight at 11:59 p.m

- Clickers? Books?

- Next H.w available

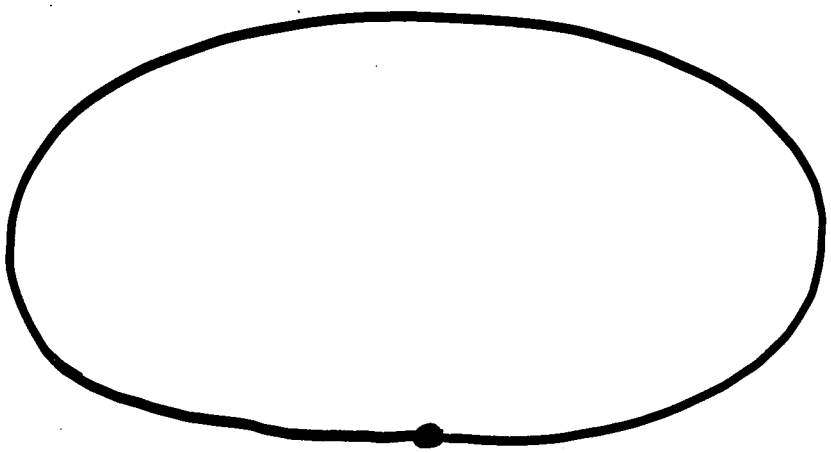
Distance - Total length object moved

Displacement : $\Delta X = X_f - X_i$



Distance : 3 km

Displacement : 1 km



travel around in a circle

Average speed

$$S_{avg} = \frac{\text{Distance}}{\text{time}}$$ magnitude only

Velocity

$$V_{avg} = \frac{x_f - x_i}{t_f - t_i} = \frac{\Delta x}{\Delta t}$$ magnitude and Direction

$$V = \lim_{\Delta t \to 0} \frac{\Delta x}{\Delta t}$$ instantaneous velocity

Ex) A car travels 1609 m in 1 Direction turns around and comes back. What is average velocity for each pass?

1) 1st pass: 4.74 s
2) 2nd pass: 4.69 s

$x_i = 0$

$x_f = 1609\ m$

$t_i = 0$

$t_f =$

1) $V_{avg} = \frac{1609\ m - 0}{4.74\ s - 0} = 339\ m/s$

2) $V_{avg} = \frac{-1609\ m}{4.69\ s} = -343\ m/s$

Average acceleration

$$a_{ave} = \frac{v_f - v_i}{t_f - t_i} = \frac{\Delta v}{\Delta t}$$

Note: object is accelerating when it changes speed or Direction

acceleration: rate at which velocity changes

acceleration also has both magnitude and direction

Instantaneous acceleration

$$a = \lim_{\Delta t \to 0} \frac{\Delta v}{\Delta t}$$

ex) Driving at 20 m/s, hit brakes and slow to 5 m/s in 2s. What is your average acceleration?

$$a = \frac{5\,m/s - 20\,m/s}{2s} = \boxed{-7.5\,m/s^2}$$

Is Deceleration the same as negative acceleration?

NO

- Negative acceleration: sign of acceleration is negative

- Deceleration: acceleration opposite to direction of motion

ex) Car traveling in negative direction at 32 m/s. Car applies brakes and stops in 7.3 s. What is car's acceleration

$$a = \frac{0-(-32\ m/s)}{7.3\ s} = +4.4\ m/s^2$$

A car travels in a straight line covering a total distance of 90.0 miles in 60.0 minutes. Which statement concerning this situation is true?

A) The velocity of the car is constant.
B) The acceleration of the car must be non-zero.
C) The first 45 miles must have been covered in 30 minutes.
D) The speed of the car must be 90 miles per hour throughout the entire trip.
E) The average velocity of the car is 90 miles per hour in the direction of motion.

what are examples of the following

1) $v > 0$ $a = 0$

2) $v < 0$ $a = 0$

3) $v > 0$ $a > 0$

4) $v < 0$ $a > 0$

5) $v = 0$ $a \neq 0$

6) speed constant $a \neq 0$

~~D~~ v constant $a \neq 0$

Interactive Question

Suppose that an object is moving with constant acceleration. Which of the following is an accurate statement concerning its motion?

A) In equal times its speed increases by equal amounts

B) In equal times its velocity changes by equal amounts.

C) In equal times it moves equal distances.

D) All of the above are true.

E) None of the above are true.

Motion Diagrams

Snapshot of an object at different times

From motion diagram can learn about objects

position
velocity
acceleration

Interactive Question

The picture below shows snapshots of an object taken at equal time intervals. Which statement is true?

A) The object is definitely moving to the right
B) The object is definitely moving to the left
C) The object is definitely speeding up
D) The object is moving at a constant speed
E) None of the above is necessarily true

Interactive Question

The picture below shows snapshots of four cars taken at equal time intervals. If the cars are moving forward, which car has the greatest magnitude of acceleration?

1) 

2) 

3) 

4) 

A) Car 1
B) Car 2
C) Car 3
D) Car 4
E) Car 1 and 3 tie

Interactive Question

Consider the two cars shown with four pictures taken at the same equal time intervals for each car. At which point(s) do the two cars have equal speeds?

(1)

(2)

(3)

(4)

(1)

(2)

(3)

(4)

A) Point 1 only
B) Point 1 and 4
C) Point 2
D) Point 3
E) Somewhere between point 2 and 3