

HW #1  
SP211 Vanhoy

Due Mon 31 August  
(at the beginning of class)

Nine Book problems

Serway Ch 1 Problems: \*\*\* none \*\*\*

Ch 2 Problems: 1, 5, 13, 15, 23, 27, 33, 39, 51

Nine multiple choice – only the answer needs to be given for the multiple choice

1. During a short interval of time the velocity  $v$  in m/s of an automobile is given by  $v = at^2 + bt^3$ , where the time  $t$  is in seconds. The units of  $a$  and  $b$  are respectively:  
A)  $m \cdot s^2$ ;  $m \cdot s^4$   
B)  $s^3/m$ ;  $s^4/m$   
C)  $m/s^2$ ;  $m/s^3$   
D)  $m/s^3$ ;  $m/s^4$   
E)  $m/s^4$ ;  $m/s^5$
2. The average speed of a moving object during a given interval of time is always:  
A) the magnitude of its average velocity over the interval  
B) the distance covered during the time interval divided by the time interval  
C) one-half its speed at the end of the interval  
D) its acceleration multiplied by the time interval  
E) one-half its acceleration multiplied by the time interval.
3. The coordinate of a particle in meters is given by  $x(t) = 12 - 3.0t^2$ , where the time  $t$  is in seconds. The particle is momentarily at rest at  $t =$   
A) 2.0 s  
B) 3.0 s  
C) 4.0 s  
D) 5.0 s

4. A drag racing car starts from rest at  $t = 0$  and moves along a straight line with velocity given by  $v = bt^2$ , where  $b$  is a constant. The expression for the distance traveled by this car from its position at  $t = 0$  is:
- A)  $bt^3$
  - B)  $bt^3/3$
  - C)  $4bt^2$
  - D)  $3bt^2$
  - E)  $bt^{3/2}$

5. Each of four particles move along an  $x$  axis. Their coordinates (in meters) as functions of time (in seconds) are given by

particle 1:  $x(t) = 3.5 - 2.7t^3$

particle 2:  $x(t) = 3.5 + 2.7t^3$

particle 3:  $x(t) = 3.5 + 2.7t^2$

particle 4:  $x(t) = 3.5 - 3.4t - 2.7t^2$

Which of these particles have constant acceleration?

- A) All four
  - B) Only 1 and 2
  - C) Only 2 and 3
  - D) Only 3 and 4
  - E) None of them
6. Each of four particles move along an  $x$  axis. Their coordinates (in meters) as functions of time (in seconds) are given by

particle 1:  $x(t) = 3.5 - 2.7t^3$

particle 2:  $x(t) = 3.5 + 2.7t^3$

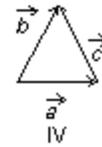
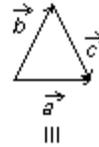
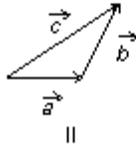
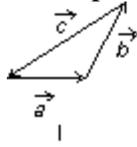
particle 3:  $x(t) = 3.5 + 2.7t^2$

particle 4:  $x(t) = 3.5 - 3.4t - 2.7t^2$

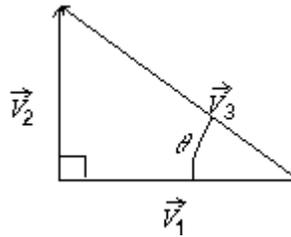
Which of these particles is speeding up for  $t > 0$ ?

- A) All four
- B) Only 1
- C) Only 2 and 3
- D) Only 2, 3, and 4
- E) None of them

7. The vectors  $\mathbf{a}$ ,  $\mathbf{b}$ , and  $\mathbf{c}$  are related by  $\mathbf{c} = \mathbf{a} + \mathbf{b}$ . Which diagram below illustrates this relationship?



- A) I.  
 B) II.  
 C) III.  
 D) IV.  
 E) None of these
8. The vector  $\mathbf{v}_3$  in the diagram is equal to:



- A)  $\mathbf{v}_1 - \mathbf{v}_2$   
 B)  $\mathbf{v}_1 + \mathbf{v}_2$   
 C)  $\mathbf{v}_2 - \mathbf{v}_1$   
 D)  $v_1 \cos \theta$   
 E)  $v_1 / (\cos \theta)$
9. The angle between  $\mathbf{r} = (25 \text{ m})\mathbf{i} + (45 \text{ m})\mathbf{j}$  and the positive  $x$  axis is:
- A)  $29^\circ$   
 B)  $61^\circ$   
 C)  $151^\circ$   
 D)  $209^\circ$   
 E)  $241^\circ$