

practice

Jan. 31, 2004

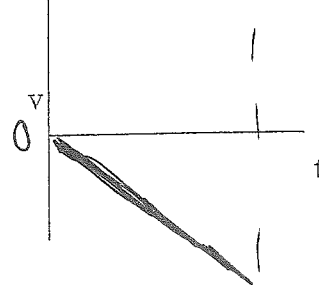
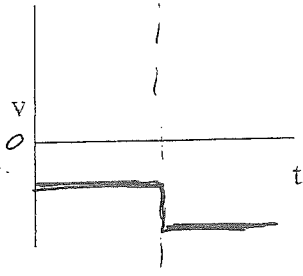
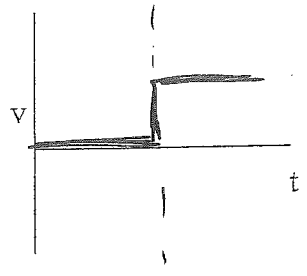
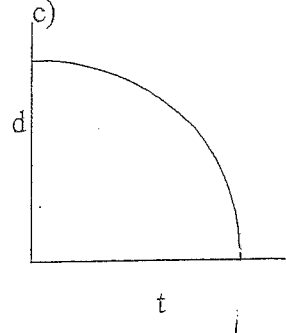
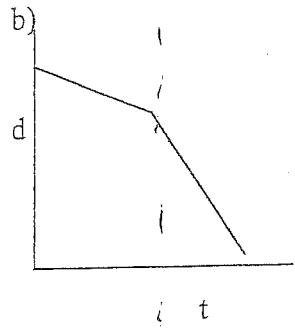
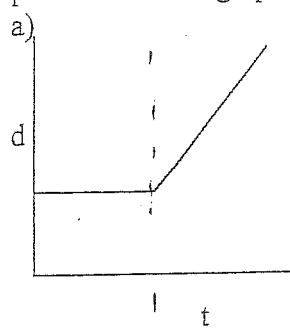
1

Physics II Quiz - Chapter 3

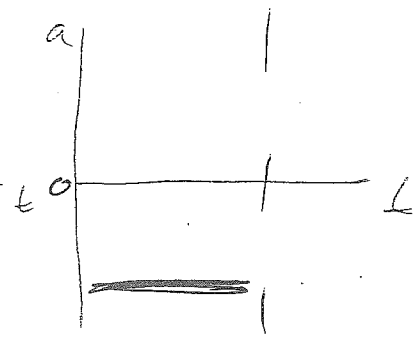
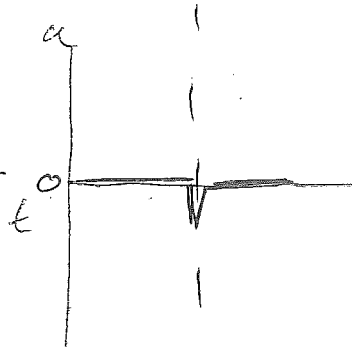
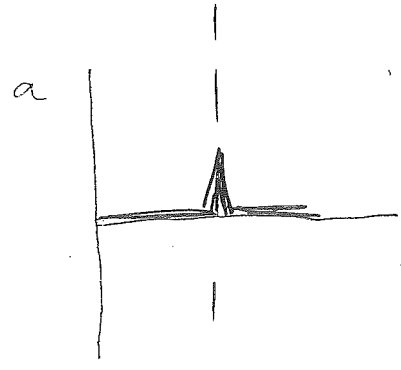
Name: K. E. /

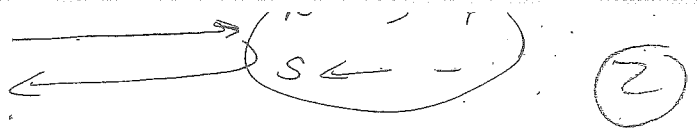
100%

1. Sketch the velocity vs time graph that corresponds to each of the following position vs time graphs.



Sketch the acceleration vs time graph for each.





2. A man drives North for one hour at a speed of 15.0 m/s, and then turns around and drives towards the South at the same speed for 20.0 minutes.

a) How far (distance) has he driven?

$$\text{dist} = v_N t_N + v_S t_S = (15 \text{ m/s})(3600 \text{ s}) + (15 \text{ m/s})(20 \text{ min} \times 60 \text{ s/min})$$

$$\boxed{\text{distance} = 7.20 \times 10^4 \text{ m} = 72.0 \text{ km}}$$

b) What was his final displacement?

$$\Delta \vec{d} = (+15 \text{ m/s})(3600 \text{ s}) + (-15 \text{ m/s})(20 \text{ min} \times 60 \text{ s/min})$$

$$\boxed{\Delta \vec{d} = +3.60 \times 10^4 \text{ m} \text{ (North)} = 36.0 \text{ km [N]}}$$

c) What was his average velocity?

$$\vec{v} = \frac{\Delta \vec{d}}{\Delta t} = \frac{36000 \text{ m}}{3600 \text{ s} + (20 \times 60)} =$$

3. A bus travels through the city for 2.0 hours at 50.0 km/h, and then for 30.0 minutes on the highway at 90.0 km/h. What was the average velocity of the bus?

Speed

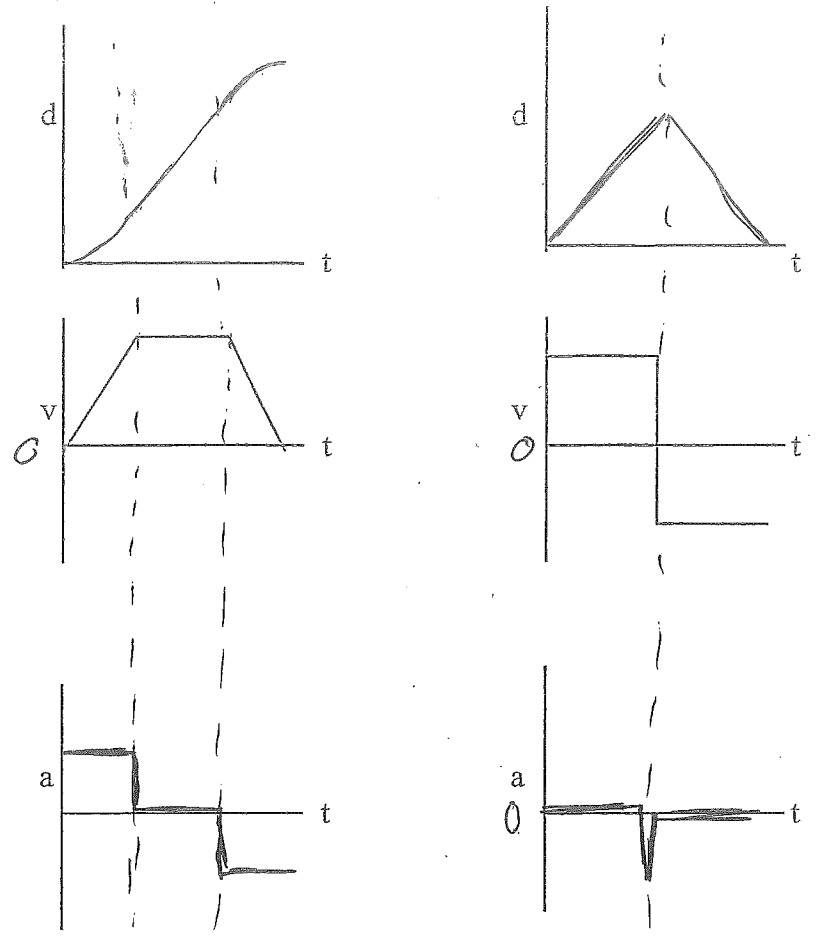
$$\text{average speed} = \frac{\text{total distance}}{\text{total time}}$$

$$= \frac{(50 \text{ km/h})(2 \text{ h}) + (90 \text{ km/h})(0.5 \text{ h})}{2.5 \text{ h}}$$

$$\text{average speed} = \boxed{58 \text{ km/h} = 16 \text{ m/s}}$$

Complete the d-t and a-t graphs corresponding to the v-t graphs shown below.

3



12. A baseball was thrown upwards from the edge of a cliff with a speed of 26.0 m/s.

a) To what maximum height above the cliff did the ball fly?

$$v_i = 26.0 \text{ m/s}$$

$$a = -9.8 \text{ m/s}^2$$

$$v_f = 0$$

$$\Delta d = ?$$

$$v_f^2 = 2a\Delta d + v_i^2$$

$$\therefore \Delta d = \frac{v_f^2 - v_i^2}{2a}$$

$$= \frac{0 - (26)^2}{2(-9.8)}$$

$$\Delta d = 34.5 \text{ m}$$

above the cliff

b) A very strong bird caught the ball in its beak when the ball was on its way down, 15.0 m below the level of the cliff. What was the velocity of the ball the instant before the bird caught it?

$$\Delta d = -15.0 \text{ m}$$

$$v_i = 26.0 \text{ m/s}$$

$$a = -9.8 \text{ m/s}^2$$

$$v_f = ?$$

$$\Delta t = ?$$

$$v_f^2 = 2a\Delta d + v_i^2$$

$$v_f = \sqrt{2(-9.8)(-15) + (26)^2}$$

$$v_f = -31.1 \text{ m/s}$$

c) How long after it was thrown was the ball caught by the bird?

$$\Delta t = \frac{v_f - v_i}{a} = \frac{-31.1 - 26}{-9.8}$$

$$\Delta t = 5.83 \text{ s}$$

practice

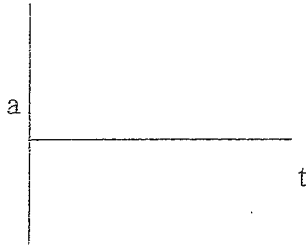
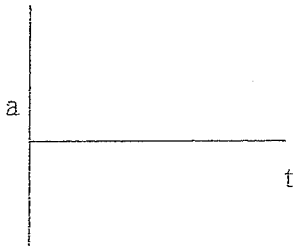
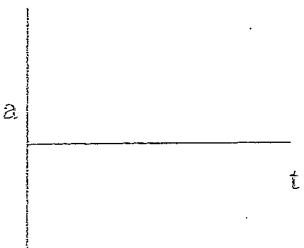
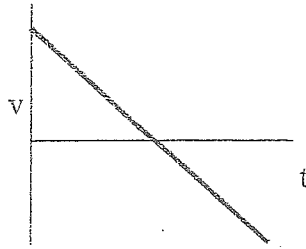
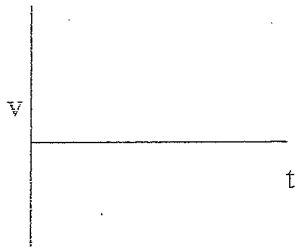
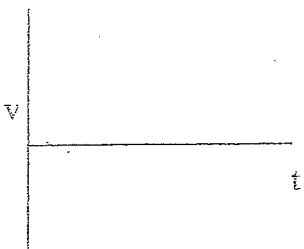
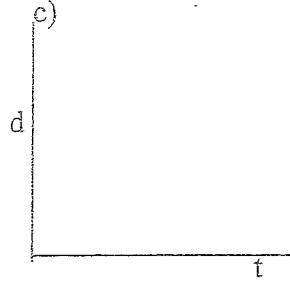
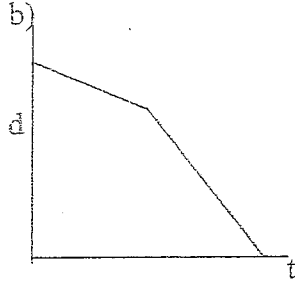
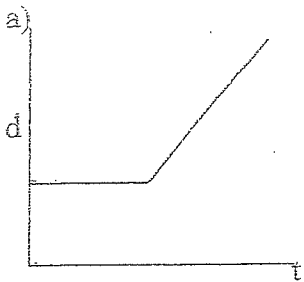
4

Physics 11 H Kinematics Quiz

Name: \_\_\_\_\_

Block: \_\_\_\_\_

1. For each of the graphs shown below, sketch the other corresponding graphs (position vs time, velocity vs time, and acceleration vs time).



2. A woman walks West for 30.0 minutes at a speed of 3.0 m/s, and then turns around and jogs toward the East for 45.0 minutes, at 5.0m/s.



a. What distance did she travel?

$$\text{dist} = v_w t_w + v_E t_E$$

$$= (3.0 \text{ m/s}) (30 \text{ min} \times \frac{60 \text{ s}}{\text{min}}) + (5.0 \text{ m/s}) (45 \text{ min} \times \frac{60 \text{ s}}{\text{min}}) = \boxed{1.89 \times 10^4 \text{ m}}$$

$$\boxed{18.9 \text{ km}}$$

b. What was her displacement when she reached the end of her trip?

$$\Delta d = (+3.0 \text{ m/s}) (30 \times 60 \text{ s}) + (-5.0 \text{ m/s}) (45 \times 60 \text{ s})$$

$$\boxed{\Delta d = -8.1 \times 10^3 \text{ m [East]}}$$

c. Calculate her average speed.

$$\text{speed} = \frac{\text{total distance}}{\text{total time}} = \frac{1.89 \times 10^4 \text{ m}}{(75 \text{ min} \times 60 \text{ s/min})} = \boxed{4.2 \text{ m/s}}$$

d. Calculate her average velocity.

$$\text{velocity} = \frac{\Delta d}{\Delta t} = \frac{-8.100 \text{ m}}{(75 \text{ min} \times 60 \text{ s/min})} = \boxed{-1.8 \text{ m/s}}$$

$$= \boxed{1.8 \text{ m/s [East]}}$$

- 3. A car moving at 60.0 km/h comes to a rest in a time of 37.0 s. How far does it travel in that time?
  
- 4. Police found skid marks 65.0 m long on a highway showing where a car made an emergency stop.
  - a. If the car was moving at 25.0 m/s at the instant the brakes were engaged, what was its acceleration while stopping?
  
  - b. How long did it take to stop (time)?
  
- 5. A 15.0 kg ball dropped off the edge of a cliff hits the ground with a speed of 45.0 m/s.
  - a. How long was the ball in the air?
  
  - b. How high was the cliff?
  
- 6. A helicopter, 45.0m above the ground, is moving up at 7.50 m/s what a child drops a stone out the window. How long is the stone in the air before it hits the ground?

Same as your quiz!