Position, Displacement and velocity

Name: _____   /27

1. Classify the following quantities as scalar or vector quantities. **(2)**
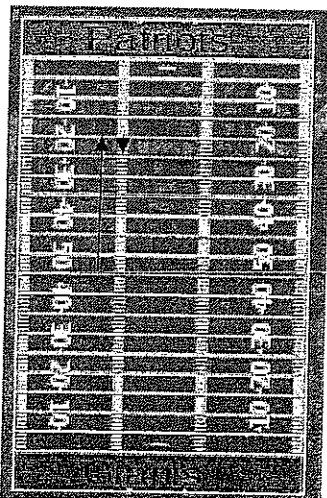   - a) distance
   - b) position
   - c) displacement
   - d) time

2. Distinguish, in your own words, between position and displacement. **(2)**

3. The New York Giants football team moves on a straight downfield pass from their 45-yard line to the Patriots 20-yard line, and then loses 5 yards on the next running play. Using the Giant's 45-yard line as the reference point:

   a) What is the ball's position after the pass? **(.5)**

   b) What is the ball's final position? **(.5)**

   c) What is the ball's total displacement? **(1)**

   d) What is the ball's total distance traveled? **(1)**

4. What is your displacement if you ride a bike 2.0 km [S] and then further 1.5 km [S]? **(1)**

5. While delivering fliers, Brad walks 1.00 km [N], 0.50 km [E], 1.00 km [S], and finally 0.50 km [W] in a total time of 1.5 h.

   a) What is the total displacement? **(1)**

   b) What is Brad's velocity? **(1)**

6. While delivering fliers, Ming walks 2.00 km [N] then 1.75 km [S] in 1.5 h. What is his average velocity? **(1)**

7. Jack takes his dog for a walk. They travel at 3.5 km/h [W] for 0.75 h. What is their displacement? **(1)**

8. A student travels 6.0 m [E] at 2.0 m/s [E]. How long is the student in motion? **(1)**
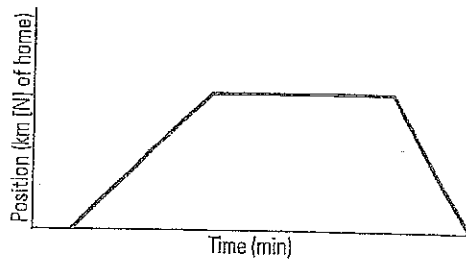
9. How can the velocity of an object be determined from a position/time graph? (1)

10. Write a description about the motion that the following graphs might describe. Include the direction and relative size of the velocities. (4)

a)

Position (km [N] of school) vs Time (min)

b)

Position (km [N] of home) vs Time (min)
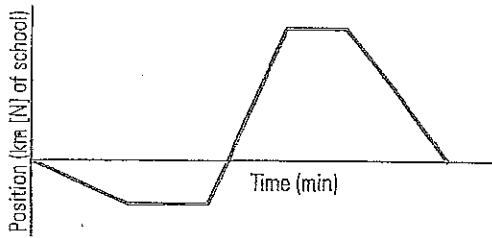
11. Draw a position/time graph for the motion of the air puck from the table below. **(3)**

Time (s)	Position (mm [N])
0	0
20	30.0
40	58.5
60	121.5
80	153.0
100	181.0
120	209.5

a) Looking at the graph, determine the velocity at 30.0 s, 50.0 s, and, **(3)**

b) Describe the velocity of the air puck from start to finish. **(2)**

c) Calculate the average velocity. **(1)**