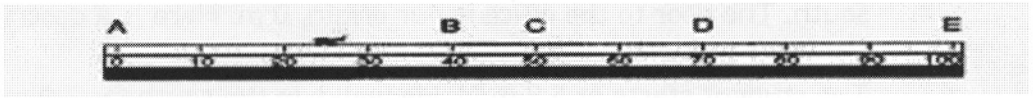


# SLA

Student Learning Activity

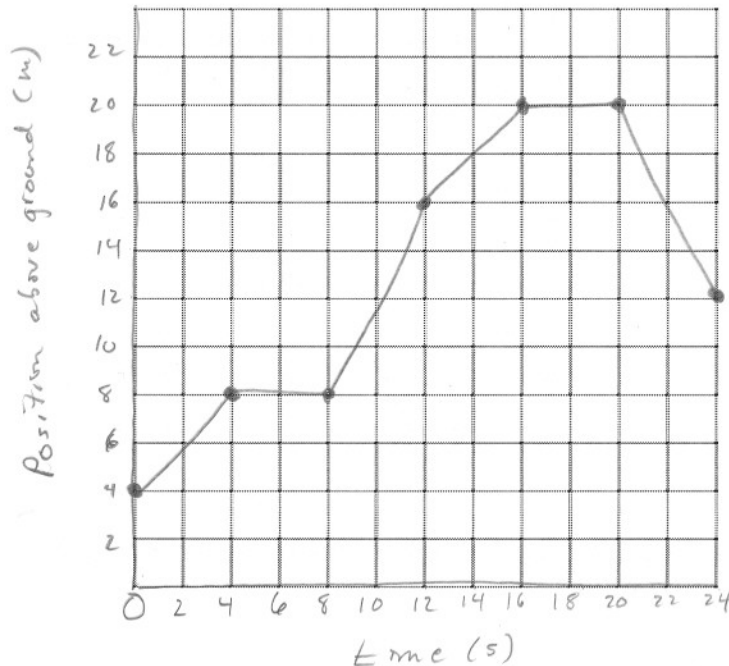
## Appendix 3.6: Describing Motion in Various Ways



- A somewhat confused ladybug is moving back and forth along a metre ruler. Determine both the displacement and distance travelled by the ladybug as it moves from:

	<u>displacement</u>	<u>distance</u>	<u>2</u>
a) A to B	40cm right	40cm	E
b) C to B	10cm left	10cm	W
c) C to D	20cm right	20cm	E
d) C to E and then to D.	20cm right	80cm	E
- In the diagram above, EAST points to the RIGHT. During which of the intervals in #1 is the ladybug moving in the EASTERLY direction? In the WESTERLY direction?
- Below is a table showing the position above the ground floor of an elevator at various times. On the graph to the right of the table, plot a graph of position-time.

Time (seconds)	0	4	8	12	16	20	24
Position above the ground floor (m)	4.0	8.0	8.0	16	20	20	12



4. A troubled student is waiting to see the principal. He paces back and forth in the hallway in front of the principal's office. The hallway runs north and south. The door to the office is our origin, 0 m. Here is a description of the student's motion.



The student starts at 5.0 m N. He walks to the south for 7.0 m during 10 s. He stands still for 5.0 s. He turns around and walks 15.0 m N during 15.0 s. He stops to say "Hello" to a friend and remains still for 10.0 s. Finally, the principal calls him to the office door. It takes the student 10.0 s to reach the door.

- a) What is the total time the student spent in the hallway?

$$10 + 5 + 15 + 10 + 10 = \underline{50s}$$

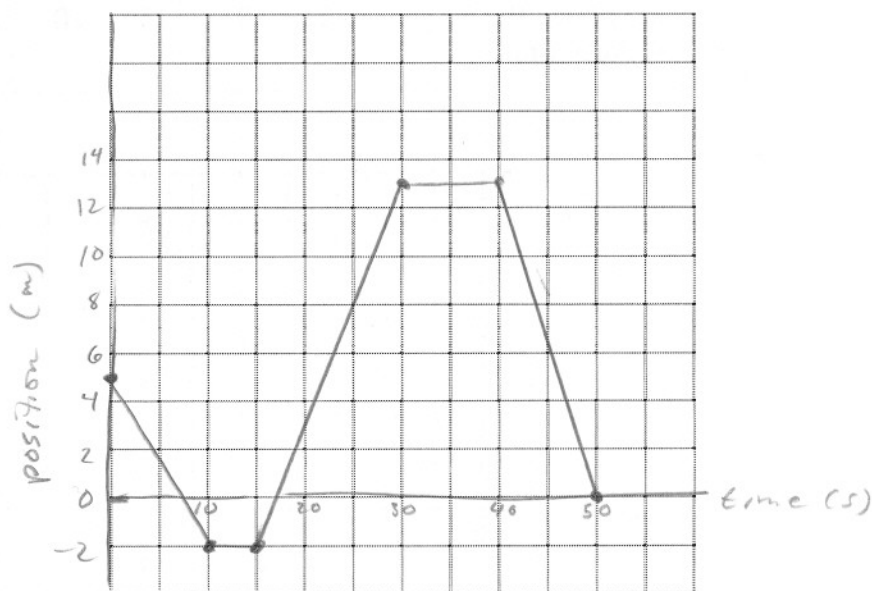
- b) What was the distance travelled by the student during his pacing?

$$7 + 15 + 13 = \underline{35m}$$

- c) What was the average speed of the student during his pacing?

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{35m}{50s} = \underline{0.7m/s}$$

- d) On the graph below, plot time on the horizontal axis and position on the vertical axis. Use straight-line segments to join the points of position-time that you plot.



- e) What is the total displacement for the student's journey? Find this from the graph.

$$\Delta d = 0 - 5 = \underline{-5m}$$

- f) What is the average velocity for the whole journey?

$$\Delta v = \frac{\Delta d}{\Delta t} = \frac{-5m}{50s} = \underline{-0.1m/s}$$

