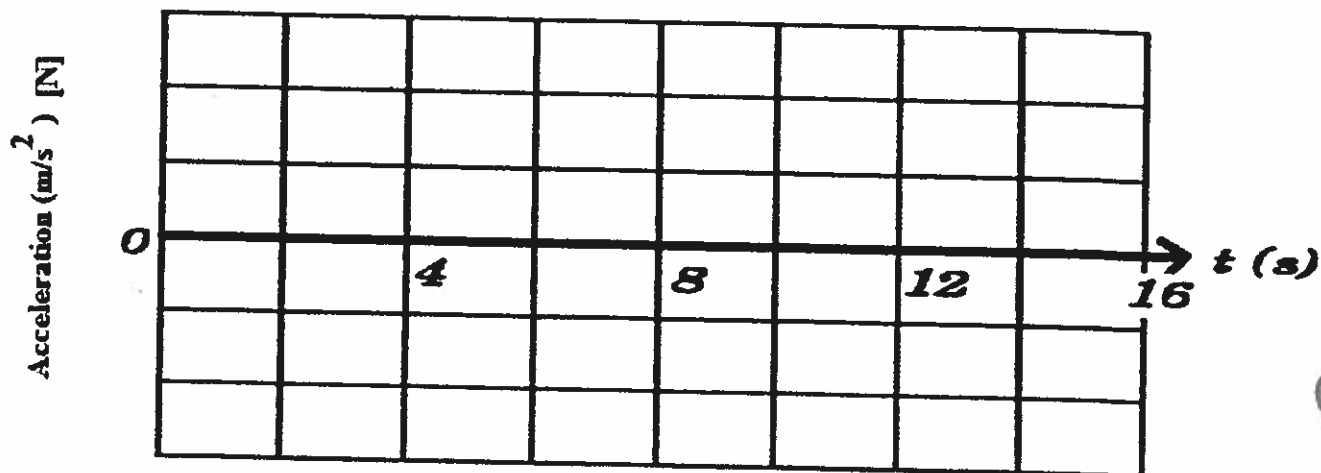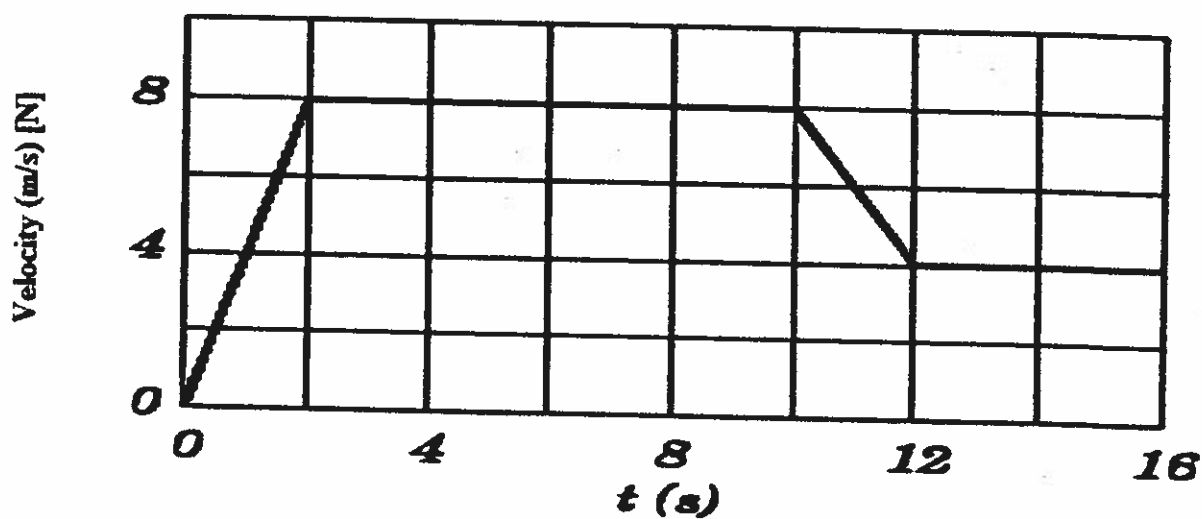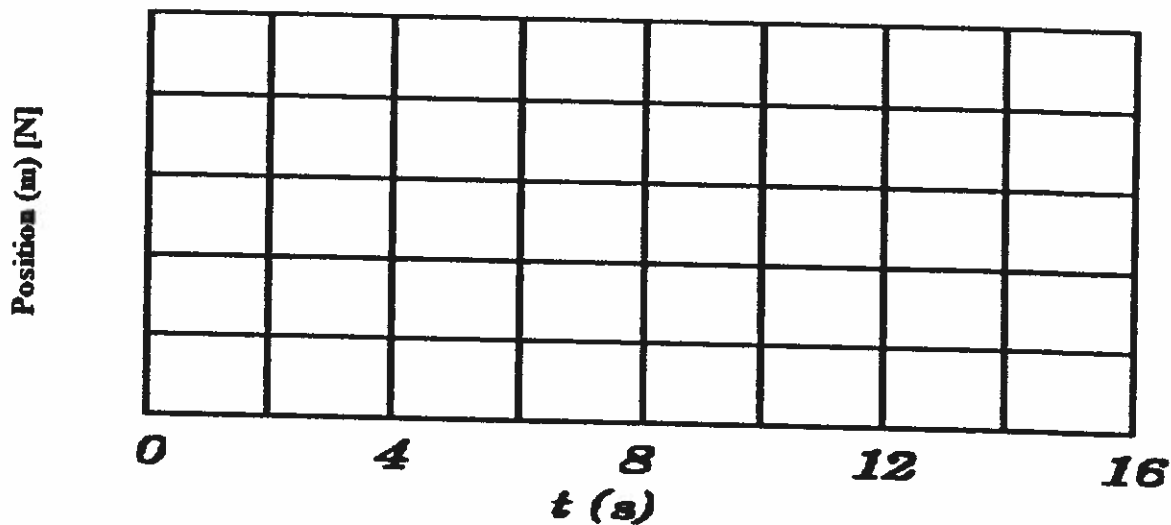A sprinter running a training drill runs North along a straight track. She starts at the starting line or origin (position zero) at time zero. Her velocity-time graph is shown below.
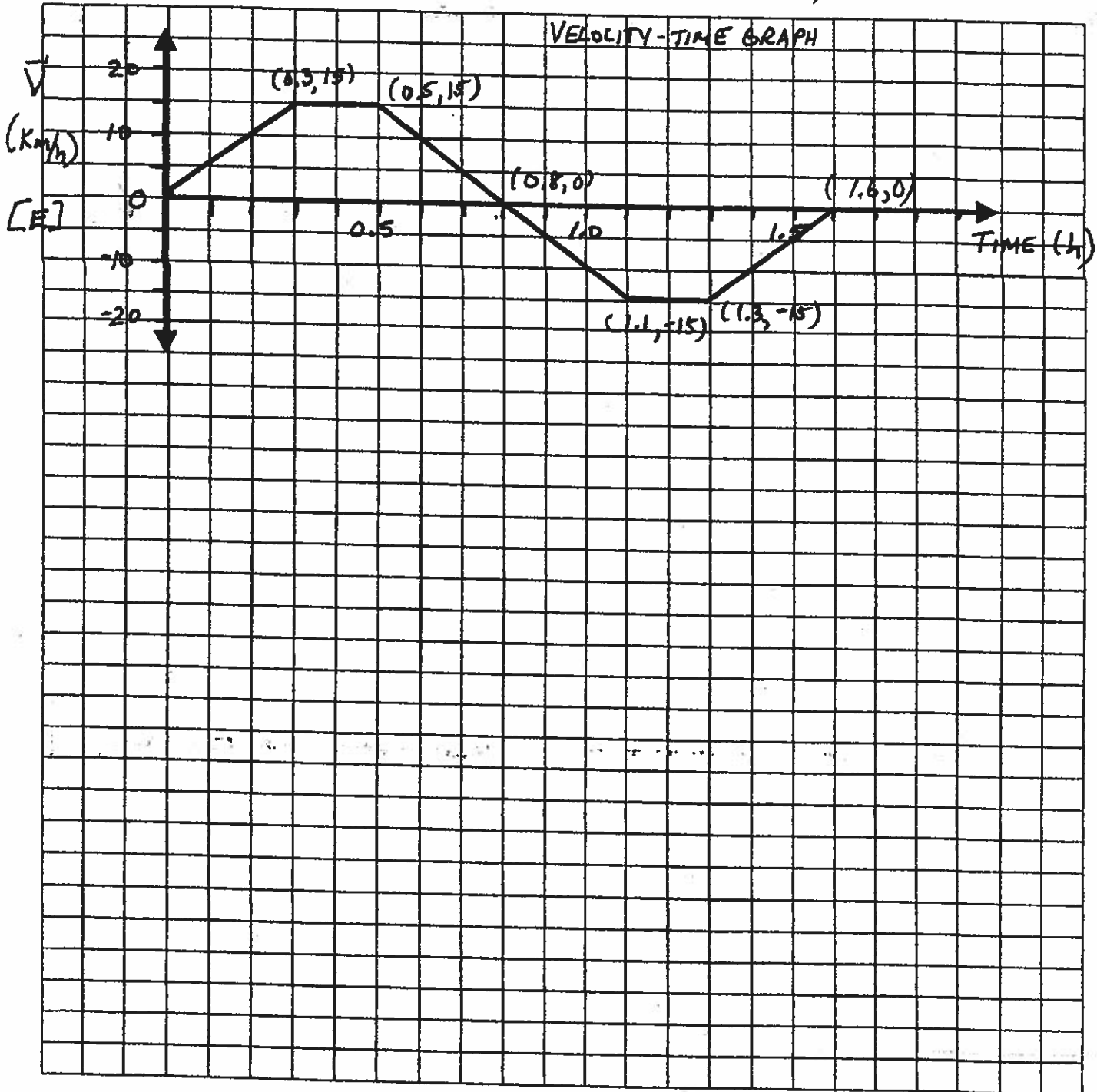
a) Describe her motion.

b) Generate the corresponding acceleration-time graph and position-time graph on the grids below. Show your calculations on a separate page.

Motion Graph Analysis Practice

* Create the acceleration-time graph and position-time graph for the following graph representing a train moving on a straight track. Assume the train starts at the station (origin, 0) at time 0.
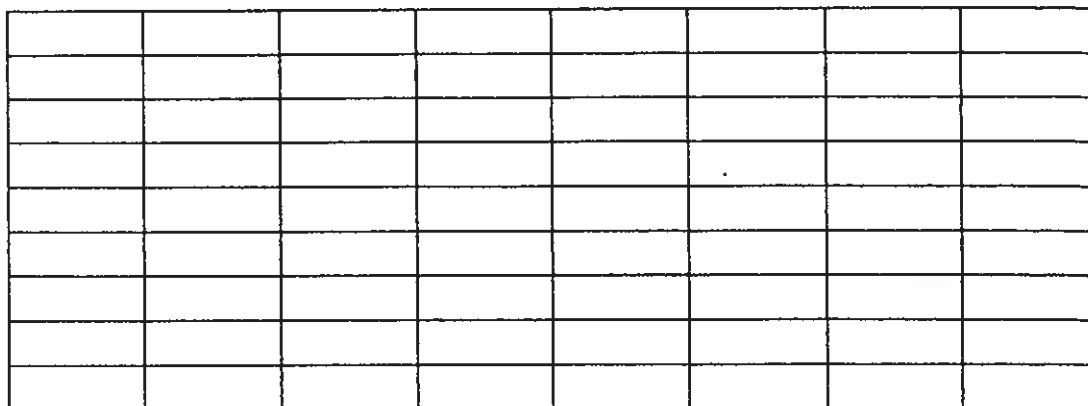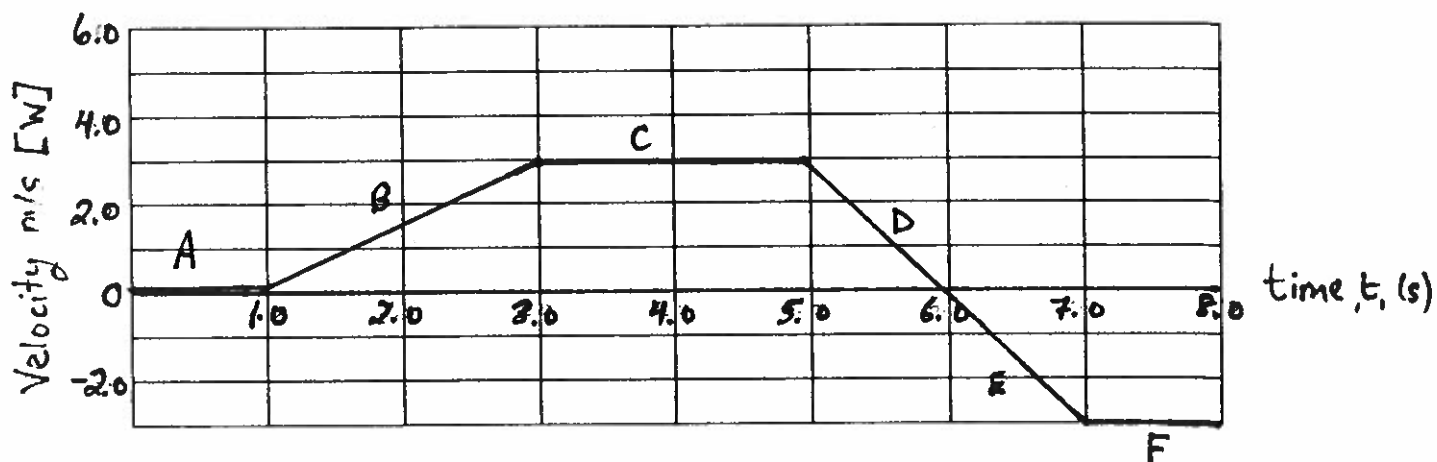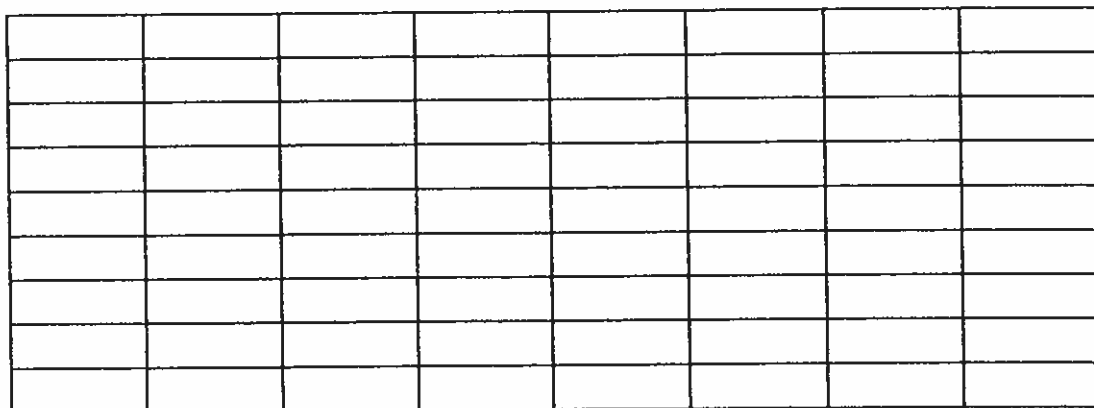
2.

VELOCITY-TIME GRAPH

$\vec{V}$ (Km/h) [E]

(0.3, 15) (0.5, 15) (0.8, 0) (1.6, 0)

20 10 0 -10 -20

0.5 1.0 1.5

TIME (h)

(1.1, -15) (1.3, -15)

Motion description:
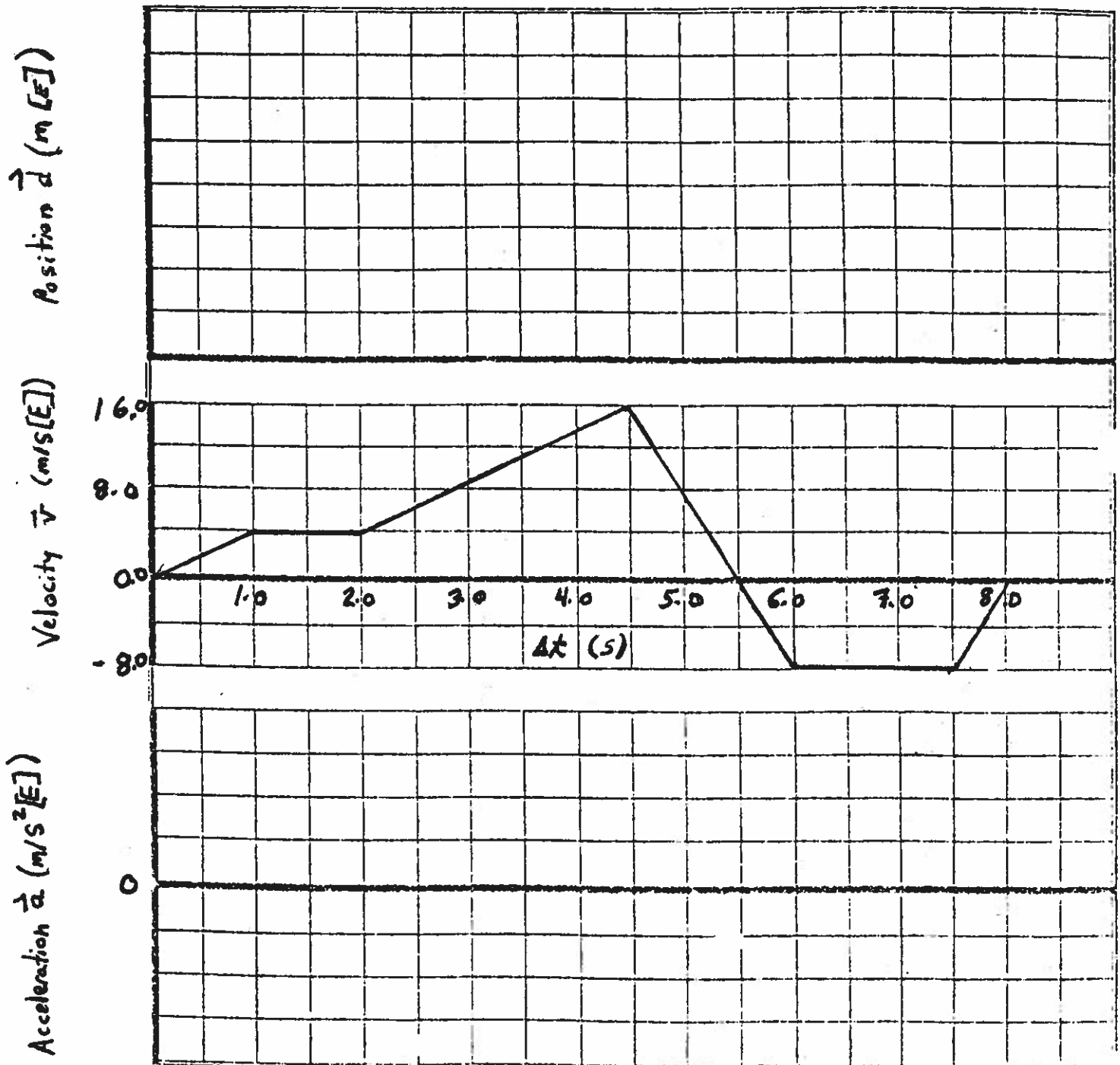
The middle graph shows the velocity-time graph for an object which started at the origin.   Determine the corresponding position-time graph and acceleration-time graph. Describe the motion of the object over the indicated intervals (A,B....etc.)

Apply the rules for interpreting and plotting graphs to draw the position-time and acceleration-time graphs for each of the velocity-time graphs given. Assume that each object starts at the origin (position 0.0 m) at time 0.0.

• Describe the motion of each object over each time interval.

Position $\vec{d}$ (m [E])

Velocity $\vec{v}$ (m/s [E])

16.0

8.0

0.0

- 8.0

1.0   2.0   3.0   4.0   5.0   6.0   7.0   8.0

Δt (s)

Acceleration $\vec{a}$ (m/s^2 [E])

0

Motion description: