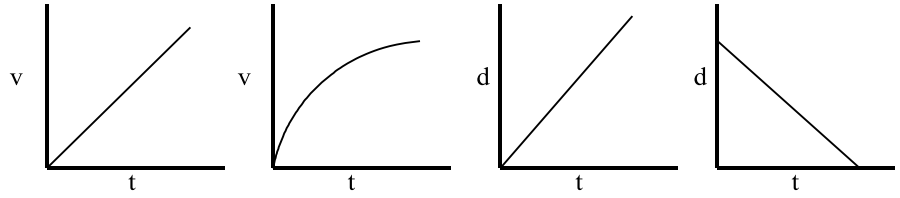
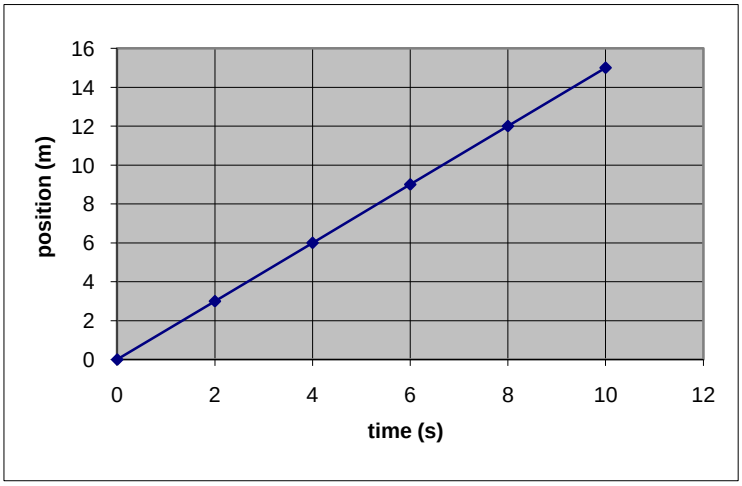
### 1.2.2 In Class or Homework Exercise

1. Describe the motion (velocity and direction) in each of the following graphs:



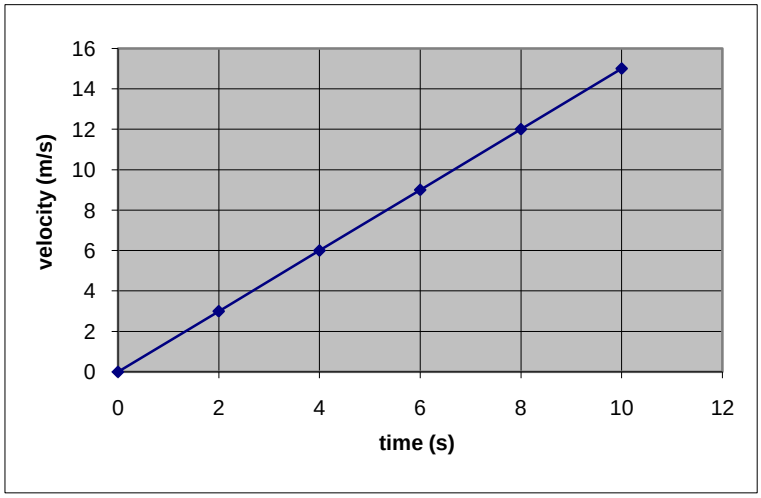

- Speeding up at a constant rate (since the graph is increasing constantly) and going forward (since the velocity is positive)
- Speeding up (since the graph is still increasing, but not at a constant rate) and going forward (since the velocity is positive)
- Constant speed (since the graph is linear) and going forward (since the position is increasing)
- Constant speed (since the graph is linear) and going backward (since the position is decreasing)

2. Calculate the speed of the object in the graph below.




$$v = \frac{\Delta d}{t}$$
$$= \frac{15.0 - 0}{10.0 - 0}$$
$$= \boxed{1.5 m/s}$$

3. Calculate the displacement of the object in the graph below.



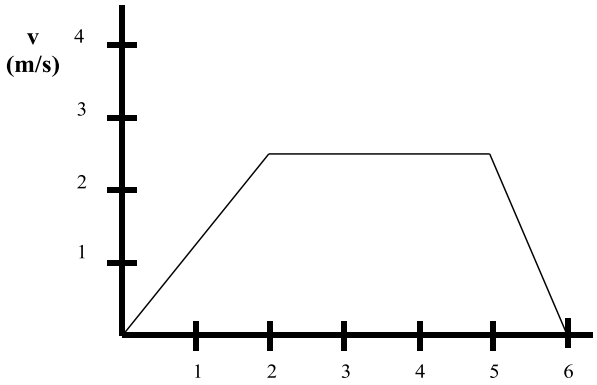

**Since the area represents the displacement,**

$\Delta\vec{d} = \frac{1}{2}bh$

$= \frac{1}{2}(10.0)(15.0)$

$= \boxed{75.0m}$

4. Answer the following questions based on the velocity-time graph below:




a. What is the speed of the object at 3.0s?
2.5 m/s

b. When is the object speeding up?
Between 0 and 2.0 s

c. When is the object slowing down?
Between 5.0 and 6.0 s

d. What is the displacement of the object between 0 and 5.0s?

$$\Delta\vec{d}_t = \Delta\vec{d}_1 + \Delta\vec{d}_2$$
$$= \tfrac{1}{2}(2.0)(2.5) + (3.0)(2.5)$$
$$= 2.5 + 7.5$$
$$= \boxed{10.0m}$$

e. What is the average speed for the first 5.0 s?

$$v = \frac{\Delta d}{t}$$
$$= \frac{10.0}{5.0}$$
$$= \boxed{2.0m/s}$$