Description of motion	$\vec{d}$-t graph	$\vec{v}$-t graph	Velocity (+/-/0)	Acceleration (+/-/0)	Example
Constant velocity forward					
Constant velocity backwards					
Speeding up forward					
Speeding up backwards					
Slowing down forward					
Slowing down backwards					
			O	$+$	
			O	$-$	

Shapes of Kinematic Graphs

Exercise 1-4:
Fill in the shape of the missing graph in each of the following set of three.

|	d vs t	v vs t	a vs t
rest			
constant positive velocity			
constant negative velocity			
constant positive accel.	speeding up +ve direction		
constant negative accel.	slowing down +ve direction		
constant negative accel.	speeding up -ve direction		
constant positive accel.	slowing down -ve direction		
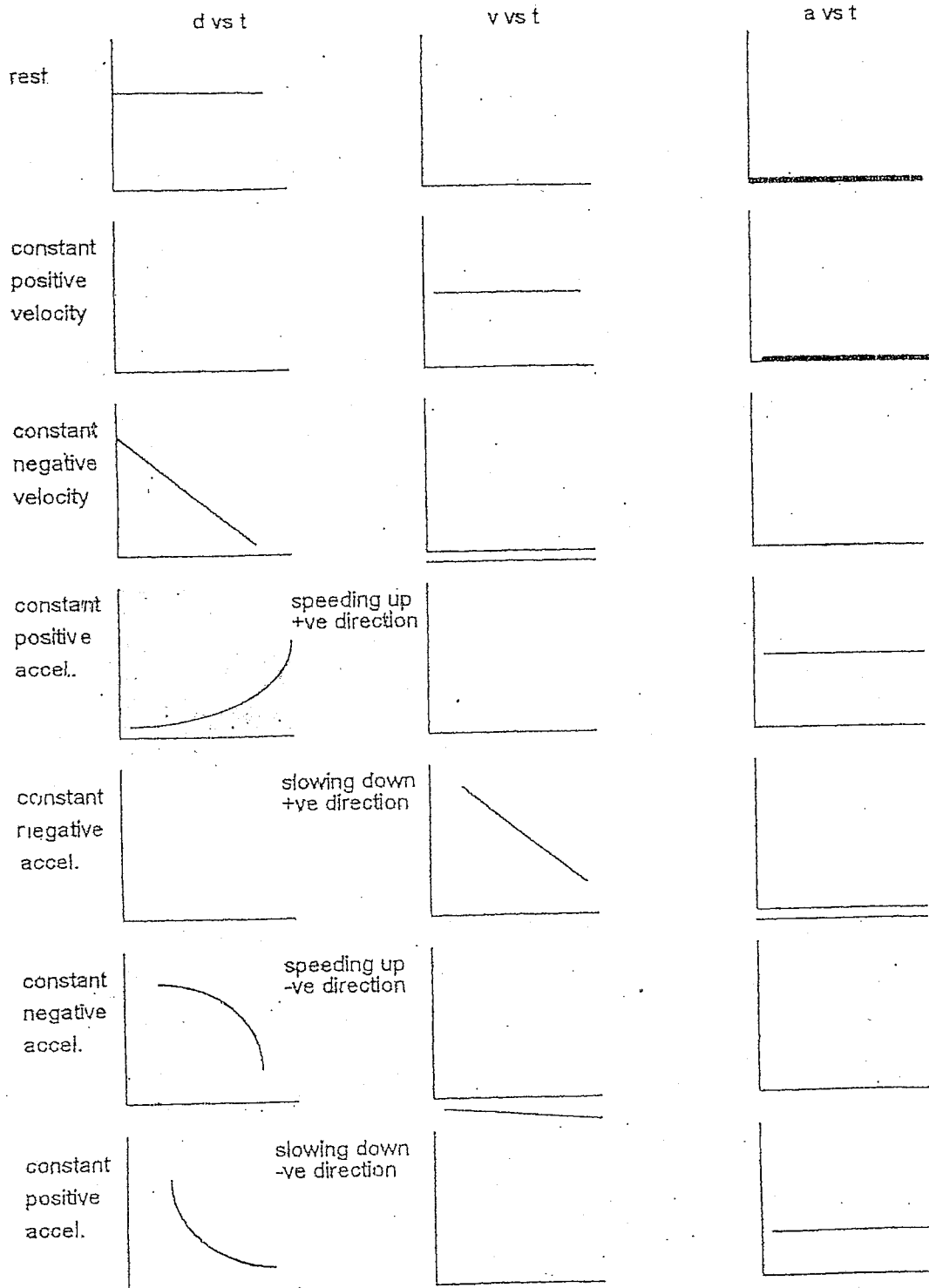
Worksheet: Graphs

Sketch the *d-t*, *v-t* and *a-t* graphs for each of the following motions. In each case, (i) assume that the position of the object is $d = 0$ when the time is $t = 0$, unless otherwise stated, and (ii) take the direction of the initial part of the motion to be the *positive* direction for your graphs.

1. Initially at a height $h > 0$, a ball falls freely from rest, hits the ground, then rebounds to a maximum height less than h , stops momentarily before falling again.
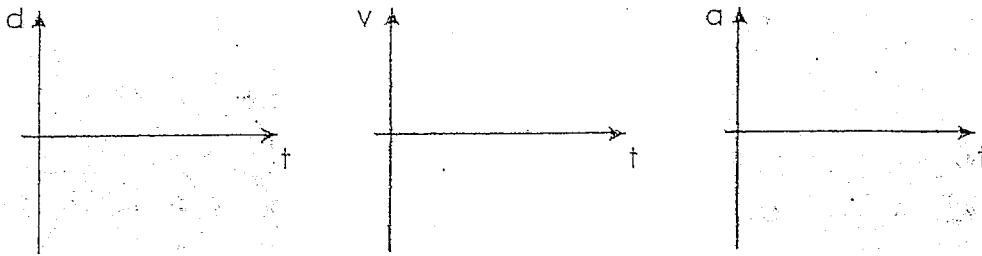
2. Initially at the edge of a cliff, a rock is thrown vertically upwards and then, in the downward motion from the maximum height, reaches the sea below the cliff.
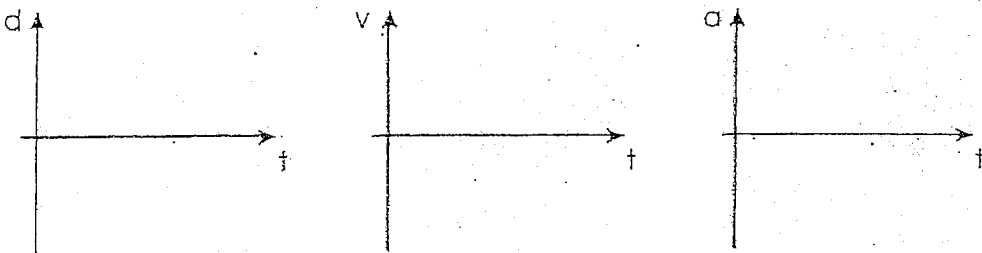
3. A car on a highway initially moving at a constant speed, and then, on observing a police car passing by, starts to slow down with a constant deceleration.
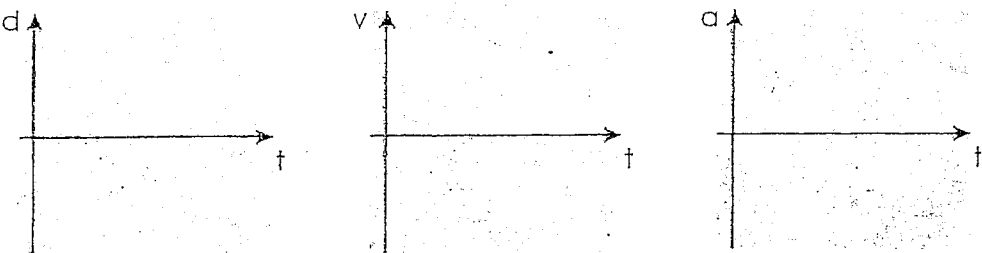
4. A police car initially moving at a constant speed, and then, on observing a speeding car, starts to speed up with a constant acceleration in chase of the speeder.
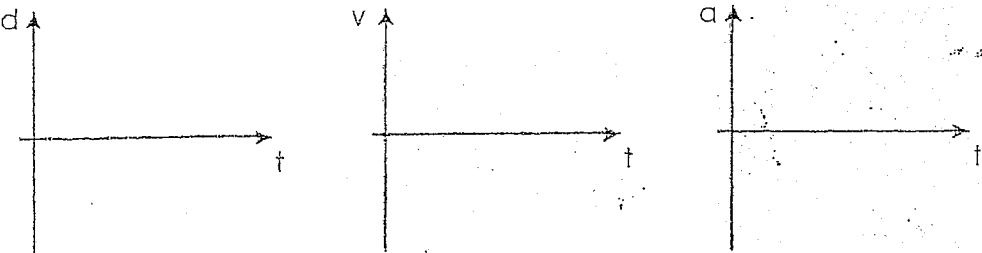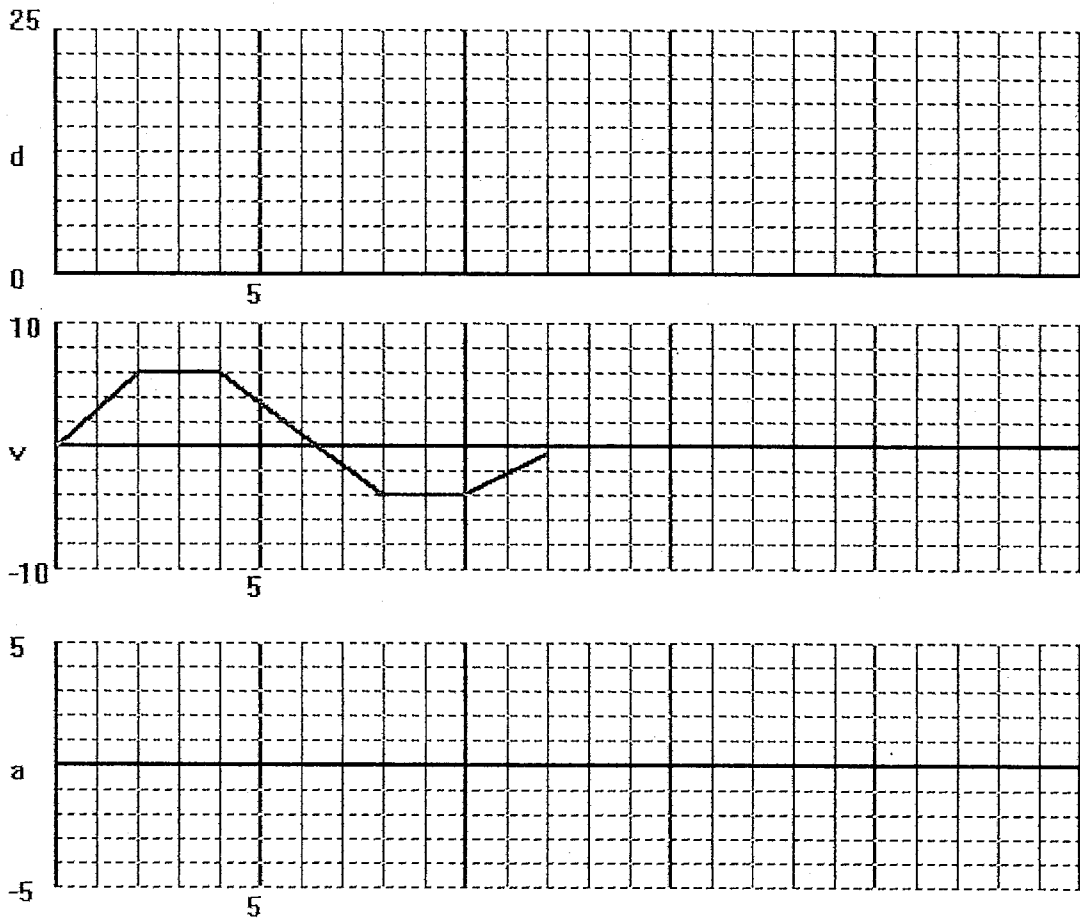
SPH 3U1 $\vec{d}$-t, $\vec{v}$-t, $\vec{a}$-t Graphs

Describe the motion of the car with the following $\vec{v}$-t graph. Assume that [E] is positive.

Sketch the corresponding $\vec{d}$-t and $\vec{a}$-t graphs.

Describe the motion of the car with the following $\vec{v}$-t graph. Assume that [E] is positive.

Sketch the corresponding $\vec{d}$-t and $\vec{a}$-t graphs.