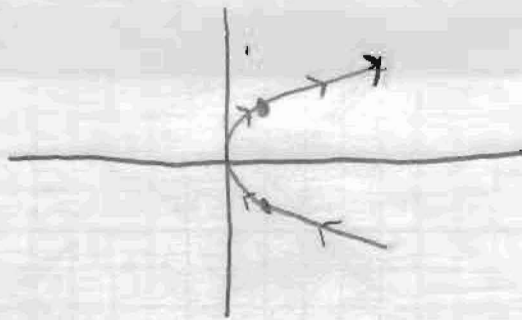


### 13.1 Answers

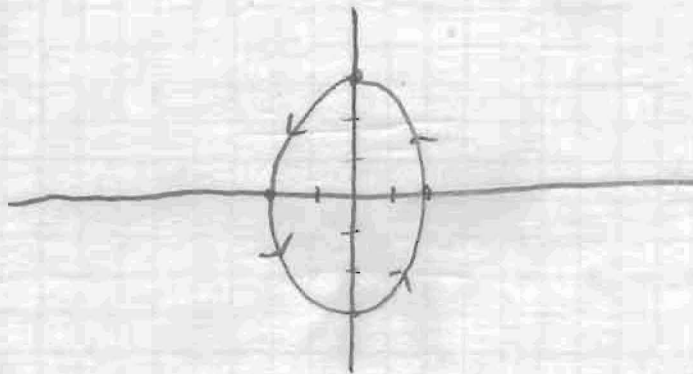
1.  $[\frac{1}{2}, \infty)$

2. a)  $\langle 0, -1, -1/24 \rangle$ , b)  $\langle 0, \pi/2, 2 \rangle$

③ a)  $r(t) = \langle t^2, t \rangle$

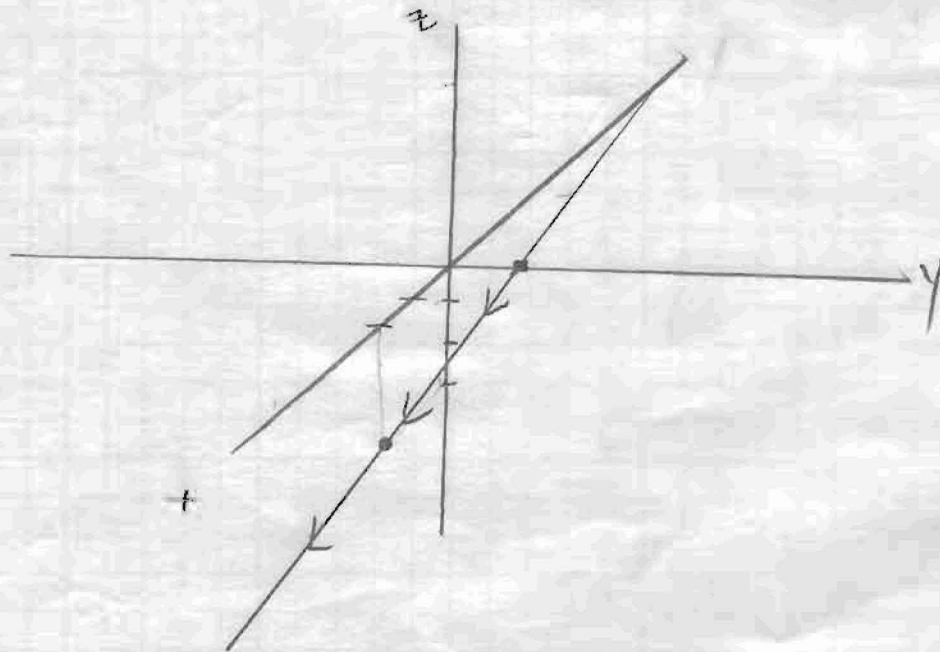


b)  $x = 2 \cos t$  ,  $y = 3 \sin t$   
 $\frac{x}{2} = \cos t$  ,  $\frac{y}{3} = \sin t$   
 $\frac{x^2}{4} + \frac{y^2}{9} = 1$



c)  $r(t) = 2t \vec{i} + (1-t) \vec{j} - 3t \vec{k}$

| t | x | y | z  |
|---|---|---|----|
| 0 | 0 | 1 | 0  |
| 1 | 2 | 0 | -3 |



$$d) \quad r(t) = \langle t, 2\sin t, \cos t \rangle$$

| $t$              | $x$              | $y$ | $z$ |
|------------------|------------------|-----|-----|
| 0                | 0                | 0   | 1   |
| $\frac{\pi}{2}$  | $\frac{\pi}{2}$  | 2   | 0   |
| $\pi$            | $\pi$            | 0   | -1  |
| $\frac{3\pi}{2}$ | $\frac{3\pi}{2}$ | -2  | 0   |
| $2\pi$           | $2\pi$           | 0   | 1   |

