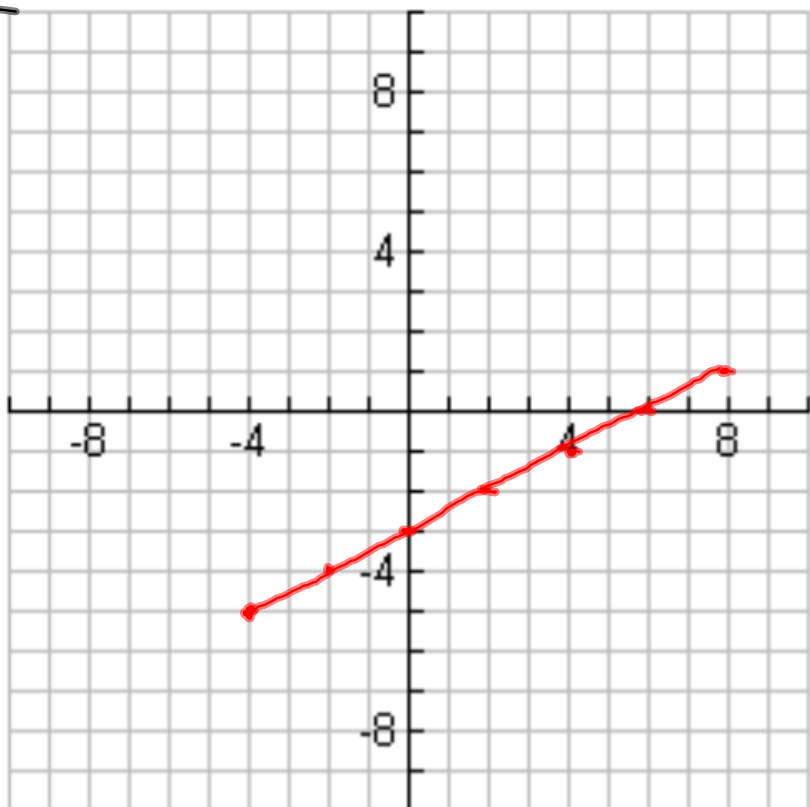


## **3.6- Parametric Equations**

$$\begin{cases} x(\tau) = -2\tau + 2 \\ y(\tau) = -\tau - 2 \\ -3 \leq \tau \leq 3 \end{cases}$$

| t  | x  | y  |
|----|----|----|
| -3 | 8  | 1  |
| -2 | 6  | 0  |
| -1 | 4  | -1 |
| 0  | 2  | -2 |
| 1  | 0  | -3 |
| 2  | -2 | -4 |
| 3  | -4 | -5 |



$$\begin{cases} x(t) = -2t - 6 \\ y(t) = 3t - 1 \end{cases}$$

Method 1

$$\begin{array}{r} x = -2t - 6 \\ +6 \qquad +6 \end{array}$$

$$\begin{array}{r} x + 6 = -2t \\ \underline{-2 \quad -2 \quad -2} \end{array}$$

$$-\frac{1}{2}x - 3 = t$$

$$y = 3\left(-\frac{1}{2}x - 3\right) - 1$$

$$y = -\frac{3}{2}x - 9 - 1$$

$$y = -\frac{3}{2}x - 10$$

Method 2

$$t = -\frac{1}{2}x - 3$$

$$\begin{array}{r} y = 3t - 1 \\ +1 \qquad +1 \end{array}$$

$$\begin{array}{r} y + 1 = 3t \\ \underline{\quad \quad \quad} \end{array}$$

$$\frac{1}{3}y + \frac{1}{3} = t$$

$$\left[ \frac{1}{3}y + \frac{1}{3} = -\frac{1}{2}x - 3 \right]$$

$$\begin{array}{r} 2y + 2 = -3x - 18 \\ \underline{-2 \qquad -2} \end{array}$$

$$\begin{array}{r} 2y = -3x - 20 \\ \underline{\quad \quad \quad} \end{array}$$

$$y = -\frac{3}{2}x - 10$$

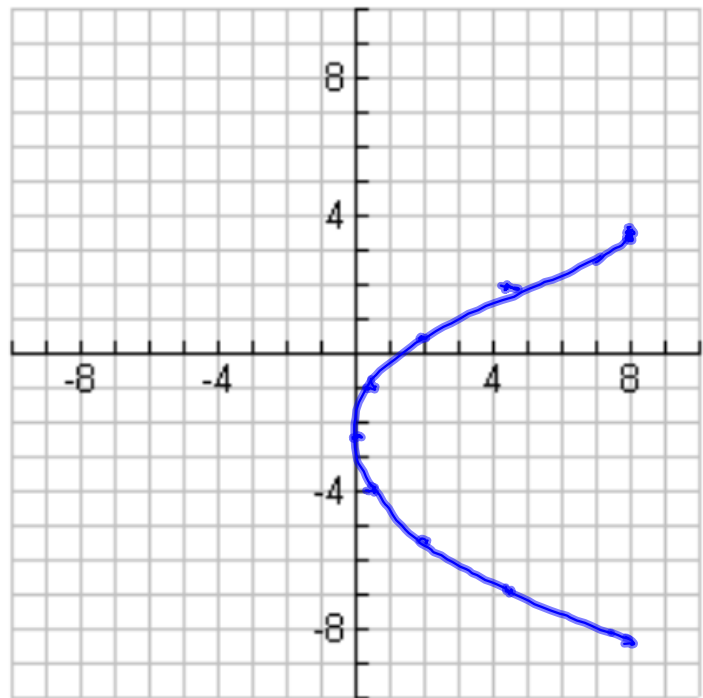
# Homework

Pg. 199-201 #12-26 even, 35, 37

$$14) \begin{cases} x(t) = t^2 \\ y(t) = 3t - 5 \end{cases}$$

$$-4 \leq t \leq 4$$

| t  | x  | y   |
|----|----|-----|
| -4 | 16 | -17 |
| -3 | 9  | -14 |
| -2 | 4  | -11 |
| -1 | 1  | -8  |
| 0  | 0  | -5  |
| 1  | 1  | -2  |
| 2  | 4  | 1   |
| 3  | 9  | 4   |
| 4  | 16 | 7   |



$$16) \begin{cases} x(t) = t + 3 \\ y(t) = 3t \end{cases}$$

$$\begin{array}{r} x = t + 3 \\ -3 \quad -3 \\ \hline t = x - 3 \end{array}$$

$$y = 3(x - 3)$$

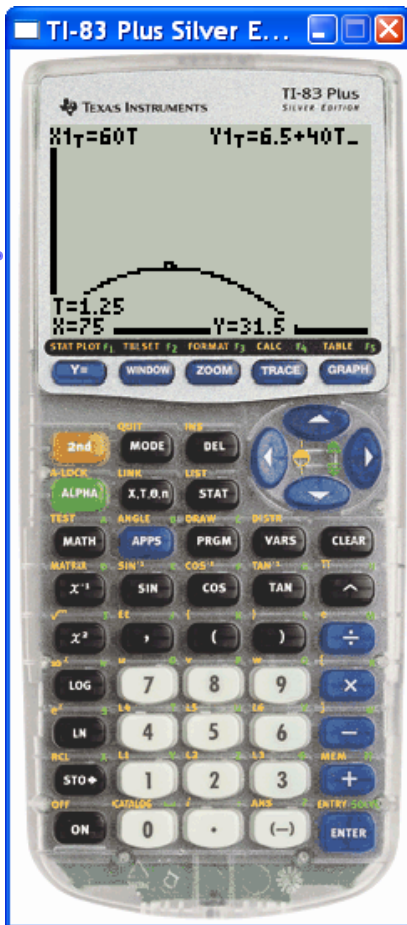
$$y = 3x - 9$$

$$22) \begin{cases} x(t) = t^2 \\ y(t) = \frac{t}{2} \end{cases} \rightarrow \left[ y = \frac{t}{2} \right]_2$$
$$t = 2y$$

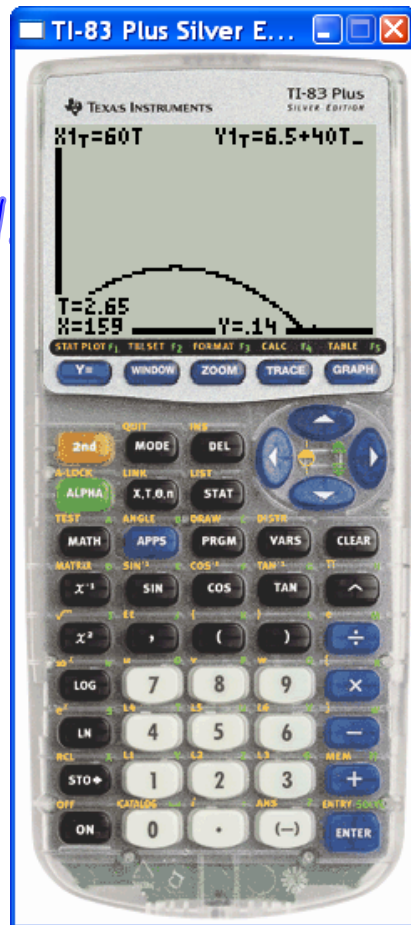
$$x = (2y)^2$$
$$x = 4y^2$$
$$y = \pm \frac{\sqrt{x}}{2}$$

35)

31.5 ft.  
in  
1.25 s



159 ft  
in  
2.65 s



$$37) \ a) \ \begin{cases} x(T) = 160T \\ y(T) = 2000 - 15T \end{cases}$$

$$b) \ 0 = 2000 - 15T$$
$$\begin{array}{r} -2000 \quad -2000 \\ \hline -2000 = -15T \\ \hline -15 \quad -15 \\ \hline \end{array}$$
$$133\frac{1}{3} \text{ sec.} = T$$

$$c) \ 160(133\frac{1}{3}) = 21,333\frac{1}{3} \text{ ft.}$$