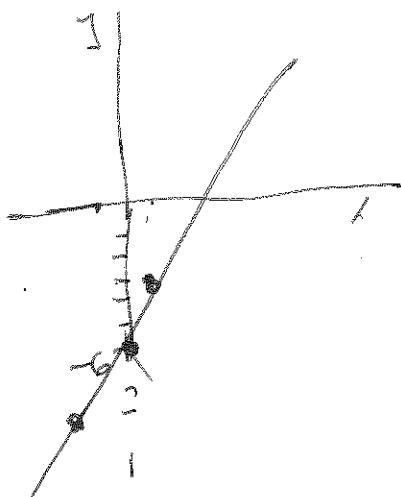


3-M/

$$\vec{r} = ((2-t^2)\mathbf{i} - 3t^2\mathbf{j}) \text{ m}$$

$$a) \quad \begin{cases} x = 2-t^2 \\ y = -3t^2 \end{cases} \quad \begin{cases} t^2 = -x+2 \\ y = -3(-x+2) = -3x+6 \end{cases}$$

| | |
|----|----|
| x | 7 |
| 0 | -6 |
| -1 | -9 |
| 2 | -3 |



$$b) \quad \vec{v} = \frac{d\vec{r}}{dt} = \frac{d((2-t^2)\mathbf{i} - 3t^2\mathbf{j})}{dt} \text{ m/s} \quad \left| \quad |\mathbf{v}| = \sqrt{(2t)^2 + (6t)^2} = 6\sqrt{5}t \text{ m/s} \right.$$

$$= \boxed{(-2t\mathbf{i} - 6t\mathbf{j}) \text{ m/s}}$$

$$\vec{a} = \frac{d\vec{v}}{dt} = \frac{d(-2t\mathbf{i} - 6t\mathbf{j})}{dt} \text{ m/s}^2 = \boxed{-2\mathbf{i} - 6\mathbf{j} \text{ m/s}^2}$$

$$\boxed{|\vec{a}| = 6\sqrt{5} \text{ m/s}^2}$$

$$c) \quad \vec{v}_m = \frac{\vec{v}(7) - \vec{v}(2)}{5} =$$

$$\vec{v}(7) = (-14\mathbf{i} - 42\mathbf{j}) \text{ m/s}$$

$$\vec{v}(2) = (-4\mathbf{i} - 12\mathbf{j}) \text{ m/s}$$

$$\vec{v}_m = \frac{(-14\mathbf{i} - 42\mathbf{j}) - (-4\mathbf{i} - 12\mathbf{j})}{5} = (-2\mathbf{i} - 8\mathbf{j}) \text{ m/s}$$

EJERCICIOS 1

3/

$$\vec{r} = (6 - 2t^2)\vec{i} + 5t^2\vec{j} \quad (\text{m})$$

a) $\vec{r}(0) = 6\vec{i} \text{ m}$

b) $\vec{r}(1) = ((6 - 2 \cdot 1^2)\vec{i} + 5 \cdot 1^2\vec{j}) \text{ m}$
 $= (4\vec{i} + 5\vec{j}) \text{ m}$

$$\vec{r}(2) = ((6 - 2 \cdot 2^2)\vec{i} + 5 \cdot 2^2\vec{j}) \text{ m}$$
$$= ((6 - 8)\vec{i} + 20\vec{j}) \text{ m}$$
$$= (-2\vec{i} + 20\vec{j}) \text{ m}$$

c)

$$\Delta \vec{r} = \vec{r}_2 - \vec{r}_1 = (-2\vec{i} + 20\vec{j}) \text{ m} - (4\vec{i} + 5\vec{j}) \text{ m}$$
$$= (-6\vec{i} + 15\vec{j}) \text{ m}$$

$$|\Delta \vec{r}| = \sqrt{(-6)^2 + (15)^2} = \boxed{16,77 \text{ m}}$$

d)

$$\vec{v}_m = \frac{\Delta \vec{r}}{\Delta t} = \frac{(-6\vec{i} + 15\vec{j}) \text{ m}}{2 - 1 \text{ s}} = (-6\vec{i} + 15\vec{j}) \text{ m/s}$$

5

$$x = 10t \quad y = 10t - 5t^2 \text{ (m)}$$

a)

| t (s) | x (m) | y (m) | \vec{r} |
|-------|-------|-------|---------------------------|
| 0,5 | 5 | 3,75 | $(5i + 3,75j) \text{ m}$ |
| 1 | 10 | 5 | $(10i + 5j) \text{ m}$ |
| 1,5 | 15 | 3,75 | $(15i + 3,75j) \text{ m}$ |
| 2 | 20 | 0 | 20i m |

b)

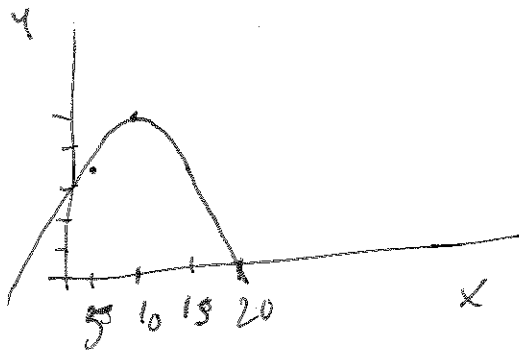
$$x = 10t \quad t = \frac{x}{10}$$

$$y = 10\left(\frac{x}{10}\right) - 5\left(\frac{x^2}{100}\right)$$

$$y = x - 0,05x^2$$

Ecuación de movimiento

$$\vec{r} = (10ti - (10t - 5t^2)j) \text{ m}$$



c)

$$\Delta \vec{r}_{(0,5;1,5)} = \vec{r}_{(1)} - \vec{r}_{(0,5)} = (10i + 5j) \text{ m} - (5i + 3,75j) \text{ m} =$$

$$= (5i + 1,25j) \text{ m}$$

$$\Delta \vec{r}_{(1,5;2)} = 20i \text{ m} - (15i + 3,75j) \text{ m} =$$

$$= (5i - 3,75j) \text{ m}$$

d) No porque no es un movimiento rectilíneo