## Vorable Gleatonia

| E | j'exiced | 3 |  |
|---|----------|---|--|
|   |          |   |  |
|   |          |   |  |
|   |          |   |  |

## Variable Aleatoria

Sea X una v.a. continua cuya función de densidad es la siguiente:

$$f(x) = \begin{cases} 0.1x & \text{, } 0 < x < \sqrt{20} \\ 0 & \text{, } en \ el \ resto \end{cases}$$

Se pide:

- a) Comprobar que es una función de densidad.
- b) Obtener la probabilidad de que X tome valores entre 1 y 3.
- c) Obtener la función de distribución F(x).

a) Se tien que complie 2 condicions:

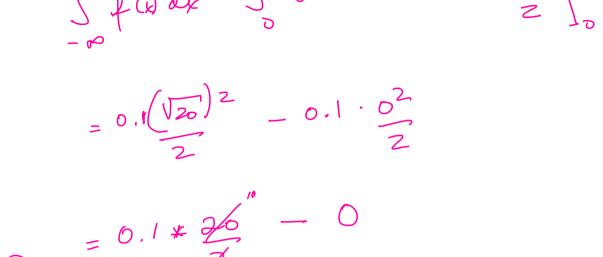
i) 
$$f(x) \ge 0$$
,  $o < x < \sqrt{z_0}$ .

2)  $\int f(x) dx = 1$ .

$$\int_{-\infty}^{\infty} f(x) dx = \int_{0}^{\sqrt{20}} 0.1 \times dx = 0.1 \times \frac{2}{2}$$

$$= 0.1 (\sqrt{20})^{2} - 0.1 \cdot 0^{2}$$

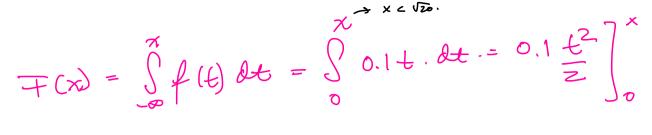
$$= 2$$



b) 
$$P(1 < X < 3) = \int_{1}^{3} f(x) dx = \int_{0.1x}^{3} o(1x) dx$$
.  
 $= 0.1 \times \frac{2}{2} \Big|_{1}^{3} = 0.1 \cdot \frac{3^{2}}{2} = 0.1 \times \frac{9}{2} = 0.1 \times \frac{9}{2} = 0.1 \times \frac{9}{2}$ 

$$= 0.1 \times \frac{2}{2} = 0.1 \cdot \frac{3^2}{2} = 0.1 \times \frac{9}{2} = 0.1$$

Si 0 < x < \( \sqrt{z0} \).



 $\mp(x) = 0.05 \times^2$ 

dF(x) = 0.1x = f(x).

 $= 0.1x^{2} - 6.1.2^{2} = 0.1x^{2}$ 

$$F(x) = \begin{cases} 0.05x^{2}. & \text{pen } 0 \leq x \leq 0. \\ 1. & \text{pen } 0 \leq x \leq \sqrt{20}. \end{cases}$$

$$\int_{0}^{20} f(t) dt = 1.$$

BONUS.
$$P(1 < x < 3) = P(x < 3) - P(x < 1)$$

$$P(1 < x < 3) = \mp(3) - \mp(1).$$

$$= 0.05 \cdot 3^{2} - 0.05 \cdot 1^{2}$$

$$= 0.47 - 0.07 = 0.4$$