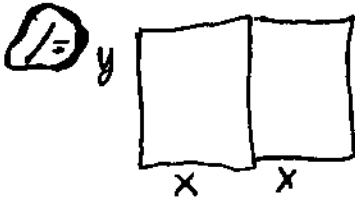


Corrección Examen de Evaluación - Matemáticas I - 1º Bachillerato
15-06-2018



$$4x + 3y = 200 \rightarrow y = \frac{200 - 4x}{3}$$

$$\max 2xy \rightarrow \max f(x) = \frac{400x - 8x^2}{3}$$

$$\text{Dom} f(x) = \mathbb{R}$$

$$f'(x) = \frac{400 - 16x}{3} = 0 \rightarrow x = \frac{400}{16} = \boxed{25 \text{ m}}$$

$$\begin{array}{c} \leftarrow \uparrow \quad \downarrow \rightarrow \\ + \quad (25) \quad - \\ \text{MAX} \end{array} \rightarrow y = \frac{200 - 100}{3} = \boxed{\frac{100}{3} \text{ m}}$$

2) 2.1) $\int (2x^4 - \frac{3}{x^2} + \frac{2}{3x+1} - e^{2x}) dx = \boxed{\frac{2}{5}x^5 + \frac{3}{x} + \frac{2}{3} \ln|3x+1| - \frac{e^{2x}}{2} + K}$

2.2) $\int \frac{x^{1/2} - x^2}{x^{3/2}} dx = \int (x^{-1} - x^{1/2}) dx = \ln|x| - \frac{x^{3/2}}{3/2} + K = \boxed{\ln|x| - \frac{2x\sqrt{x}}{3} + K}$

2.3) $\int (x^{1/2} - 5^{2x+1} + \cos(2x+1)) dx = \boxed{\frac{x^{3/2}}{3/2} - \frac{5^{2x+1}}{2 \ln 5} + \frac{\sin(2x+1)}{2} + K}$

2.4) $\int 3x \cos x dx = 3x \sin x - 3 \int \sin x dx = \boxed{3x \sin x + 3 \cos x + K}$

$$u = 3x \rightarrow du = 3 dx$$

$$d\theta = \cos x \rightarrow \theta = \sin x$$

2.5) $I = \int \sin 2x \cdot e^{3x} dx = \frac{e^{3x}}{3} \sin 2x - \frac{2}{3} \int \cos 2x e^{3x} dx = \frac{e^{3x}}{3} \sin 2x - \frac{2}{3} \left[\frac{e^{3x}}{3} \cos 2x + \frac{2}{3} I \right]$

$$u = \sin 2x \rightarrow du = 2 \cos 2x dx \quad \left| \quad u = \cos 2x \rightarrow du = -2 \sin 2x dx \right.$$

$$d\theta = e^{3x} dx \rightarrow \theta = \frac{e^{3x}}{3} \quad \left| \quad d\theta = e^{3x} dx \rightarrow \theta = \frac{e^{3x}}{3} \right.$$

$$I = \frac{e^{3x}}{3} \sin 2x - \frac{2}{9} e^{3x} \cos 2x - \frac{4}{9} I \rightarrow \frac{13}{9} I = \frac{e^{3x}}{9} (3 \sin 2x - 2 \cos 2x)$$

$$I = \frac{e^{3x}}{13} (3 \sin 2x - 2 \cos 2x) + K$$

$$2.6) \int x \cdot 5^{2x^2-3} dx = \int x 5^t \frac{dt}{4x} = \frac{1}{4} \cdot \frac{5^t}{\ln 5} + K = \frac{5^{2x^2-3}}{4 \ln 5} + K$$

$$t = 2x^2 - 3$$

$$dt = 4x dx \rightarrow dx = dt/4x$$

$$2.7) \int x \sqrt{x-1} dx = \int (t^2+1)t \cdot 2t dt = \int (4t^4 + 2t^2) dt = \frac{4t^5}{5} + \frac{2t^3}{3} + K$$

$$t^2 = x-1 \rightarrow x = t^2 + 1$$

$$2t dt = dx$$

$$= \frac{4}{5} \sqrt{x-1}^5 + \frac{2}{3} \sqrt{x-1}^3 + K$$

$$2.8) \int \frac{(x+1)^2}{x(x+1)} dx = \int \frac{x+1}{x} dx = \int \left(1 + \frac{1}{x}\right) dx = x + \ln|x| + K$$

$$2.9) \int \frac{4x+1}{x^2+2x+4} dx = 2 \int \frac{2x+2+\frac{1}{2}-2}{x^2+2x+4} dx = 2 \ln|x^2+2x+4| - 3 \int \frac{dx}{3+(x+1)^2}$$

$$= 2 \ln|x^2+2x+4| - \int \frac{dx}{1+(\frac{x+1}{\sqrt{3}})^2} = 2 \ln|x^2+2x+4| - \sqrt{3} \arctg\left(\frac{x+1}{\sqrt{3}}\right) + K$$

$$2.10) \int \frac{2}{x^2(x-2)} dx = \int \left(\frac{A}{x} + \frac{B}{x^2} + \frac{C}{x-2}\right) dx = \int \left(\frac{-3/4}{x} - \frac{1}{x^2} + \frac{1/4}{x-2}\right) dx$$

$$2 = Ax(x-2) + B(x-2) + Cx^2$$

$$x=0 \rightarrow 2 = -2B \rightarrow B = -1$$

$$x=2 \rightarrow 2 = 4C \rightarrow C = 1/2$$

$$x=1 \rightarrow 2 = -A + 1 + 1/4 \rightarrow A = -1/2$$

$$= -\frac{1}{2} \ln|x| + \frac{1}{x} + \frac{1}{2} \ln|x-2| + K$$

$$\textcircled{3} \text{ a) } \bar{x} = \frac{402}{30} = \boxed{13'4} \quad M_0 = 13 + (17-13) \frac{4}{4+8} = \boxed{14'5}$$

$$M_e = 13 + (17-13) \frac{15-13}{24-13} = \boxed{13'72}$$

$$\text{b) } D_4 = 9 + (13-9) \frac{12-6}{13-6} = \boxed{12'43}$$

$$P_{65} = 13 + (17-13) \frac{19'5-13}{24-13} = \boxed{13'36}$$

$$\text{c) } Q_3 = 13 + (17-13) \frac{22'5-13}{24-13} = 16'45 \quad Q_1 = 9 + (13-9) \frac{7'5-6}{13-6} = 9'86$$

$$R_I = 16'45 - 9'86 = \boxed{6'59}$$

$$D_M = \frac{126'40}{30} = \boxed{4'21}$$

$$\text{d) } S_x = \sqrt{\frac{6206}{30} - 13'4^2} = 5'23 \quad C_v = \frac{5'23}{13'4} = \boxed{0'39}$$

$$\textcircled{4} \text{ a) } \bar{x} = \frac{1921}{178} = \boxed{10'79}$$

$$\bar{y} = \frac{2612}{178} = \boxed{14'67}$$

$$S_x = \sqrt{\frac{24423}{178} - 10'79^2} = \boxed{4'55}$$

$$S_y = \sqrt{\frac{45200}{178} - 14'67^2} = \boxed{6'21}$$

$$\text{b) } S_{xy} = \frac{32786}{178} - 10'79 \cdot 14'67 = \boxed{25'9} \quad r = \frac{25'9}{4'55 \cdot 6'21} = \boxed{0'92}$$

$$D = 0'92^2 \cdot 100 = \boxed{84\%}$$

$$\text{c) } \hat{y} = 14'67 + \frac{25'9}{4'55^2} (1 - 10'79) = \boxed{2'42}$$

$$\text{d) } \hat{x} = 10'79 + \frac{25'9}{6'21^2} (0 - 14'67) = \boxed{0'94}$$

5) $8 \cdot 7 \cdot 6 = \boxed{336}$

6) $\frac{27 \cdot 26 \cdot 25 \cdot 24}{4!} = \binom{27}{4} = 27C4 = \boxed{17550}$

7) $\frac{7!}{3!} = \boxed{840}$

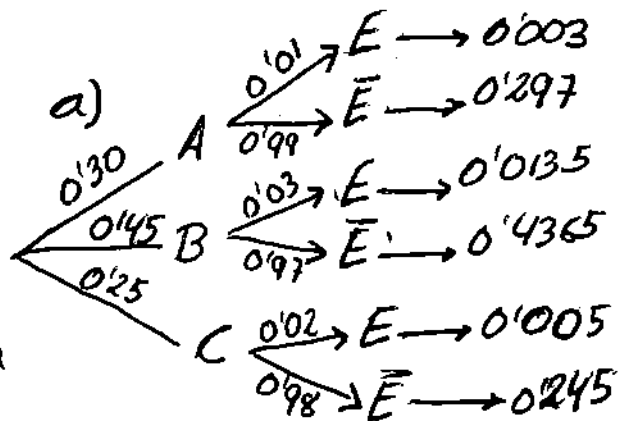
8) leyenda

A = primera persona

B = segunda "

C = tercera "

E = declaración errónea



b) $P(B \cap \bar{E}) = P(B)P(\bar{E}|B) = \boxed{0.4365}$

c) $P(E) = P(A)P(E|A) + P(B)P(E|B) + P(C)P(E|C) = 0.003 + 0.0135 + 0.005$
 $= \boxed{0.0215}$

d) $P(B|E) = \frac{P(B)P(E|B)}{P(E)} = \frac{0.4365}{1 - 0.0215} = \boxed{0.4461}$