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Problema 1

$$f_X(x) = \frac{2}{9}(x+1), \quad -1 \leq x \leq 2$$

$$f_Y(y) = \sqrt{y}$$

$$f_Y(y) = P_Y(Y \leq y) = P(X^2 = y)$$

$$= P_X(-\sqrt{y} \leq X \leq \sqrt{y})$$

$$f_Y(g) = f_X(\sqrt{y}) - f_X(-\sqrt{y})$$

$$\frac{\partial}{\partial y} f_Y = f_Y(y) = \frac{d}{dy}\left[f_X(\sqrt{y}) - f_X(-\sqrt{y})\right]$$

$$= f(x)(\sqrt{y}) * \frac{1}{2\sqrt{y}} - f_X(-\sqrt{y}) * -\frac{1}{2\sqrt{y}}$$

$$f_Y(y) = \frac{1}{2\sqrt{y}}\left(f_X(\sqrt{y}) + f_X(-\sqrt{y})\right)$$

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Problema 11

$$f(x) = \begin{cases} 6x(1-x) & 0 \leq x \leq 1 \\ 0 & e:o.p \end{cases}$$

$$f_Y(y) = \sqrt[5]{y}$$

$$F_Y(y) = P_Y(Y \leq y) = P_Y(X^3 \leq y)$$

Problema 11

X_1 → Numero de Caras
X_2 → Cantidad de Dinero

a)

X_2 \ X_1	0	1	2	3	
-1	1/8	0	0	0	1/8
1	0	1/8	1/4	1/8	1/2
2	0	1/8	1/8	0	1/4
3	0	1/8	0	0	1/8
	1/8	3/8	3/8	1/8	1

b)

$$\frac{1}{8} + \frac{1}{8} + \frac{2}{8} = \frac{4}{8} = \frac{1}{2}$$

Problema IV

a) $f(x) = \begin{cases} 3x_1, & 0 \le x_2 \le x_1 \le 1 \\ 0, & \text{e.o.p.} \end{cases}$

$$\int_0^{1/2} \int_0^{1/3} (3x_1)\, dx_2\, dx_1 = 0.125$$

b)

$$\int_0^{1} \int_0^{x_1/2} 3x_1\, dx_2 dx_1 = 0.5$$