

Problema 1

a) Pontos 3.5 8! 3!

b) Pontos 5  $\frac{1 - \binom{48}{5}}{\binom{52}{5}}$

Problema 2 7 pontos

E1 evento gano vince de 10 euros  $P(E1) = \frac{1}{6}$

E2 evento gano vince de 30 euros  $P(E2) = \left(\frac{1}{5}\right) \cdot \left(\frac{1}{5}\right) \cdot \frac{1}{6}$

E eventos gano de 100 euros  $P(E3) = P(E1) + P(E2) + \dots$

$$P(E) = \frac{1}{6} \left[ 1 + \left(\frac{1}{5}\right)^2 + \left(\frac{1}{5}\right)^4 + \dots \right] = \frac{1}{6} \sum_{k=0}^{\infty} x^{2k} = \frac{1}{6} \frac{1-x}{1-x^2}$$

$$= \frac{1}{6} \cdot \frac{1 - (1/5)^2}{1 - (1/5)^2} = \frac{11}{6}$$

Problema 3 7 pontos

Se função derivada e  $f(x) = c \left(1 - \frac{x^2}{a^2}\right)$

$$\Rightarrow \int_a^0 f(x) dx = 1 = c \int_a^0 \left(1 - \frac{x^2}{a^2}\right) dx \Rightarrow c = 3/2a$$

$$P\{C \leq 3\} = \int_0^3 f(x) dx = \frac{3c}{2} \int_0^3 \left(1 - \frac{x^2}{a^2}\right) dx = \frac{3c}{2} \left[ x - \frac{x^3}{3a^2} \right]_0^3 = \frac{3c}{2} \left( 3 - \frac{27}{3a^2} \right) = \frac{3c}{2} \left( 3 - \frac{9}{a^2} \right)$$

Problema 4 5 pontos

$$1 - P\{X \leq 1.5\} = 1 - P\{X \leq 1.5\} = 1 - 0.496 - 0.502 = 1 - 1.2 = 0.508 - 0.502 = 0.006$$

$$= 1 - 0.272 = 0.728 \approx 72.8\%$$

$$= 1.2$$