STATISTICS APPLIED TO BUSINESS ADMINISTRATION. ACADEMIC YEAR 2021-2022
PRACTICAL EXERCISE 3 (20 MINUTES)

Date: _____

Complete name:_____ ID number:_____

EXERCISE 1 (4 POINTS)

Let X be a r.v. such that $X \in \gamma(a, r)$ with mean and variance equal to 2 and 4, respectively.

1. **(2 points)** Providing all relevant details, find the distribution of the r.v. X.
2. **(2 points)** Providing all relevant details, compute the value of $P(X < 2)$.

EXERCISE 2 (6 POINTS)

Let X, Y and Z be three independent r.v. such that: $X \in N(0,4)$, $Y \in \chi^2_4$ and $Z \in \gamma(\frac{1}{2}, 3)$.

1. **(2 points)** Compute the probability that the r.v. $W_1 = \left(\frac{X}{2}\right)^2 + Z$ takes on values in the interval $(2.83, 14.1)$.
2. **(2 points)** If we define the r.v. $W_2 = \frac{X}{\sqrt{Y}}$, find the value of k such that $P(W_2 > k) = 0.90$.
3. **(2 points)** If we define the r.v. $W_3 = \frac{2Z}{3Y}$, find the value of k such that $P(W_3 \geq k) = 0.90$.