

**STATISTICS APPLIED TO BUSINESS
ADMINISTRATION. ACADEMIC YEAR 2020-2021
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 $\frac{1}{2}$ and $\frac{1}{4}$, 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 $P(-\frac{1}{2} < X < \frac{1}{2})$.

EXERCISE 2 (6 POINTS)

Let X , Y , Z and V be four independent r.v. such that: $X \in N(0,9)$, $Y \in N(0,1)$, $Z \in \gamma(\frac{1}{2},4)$ and $V \in \chi_5^2$.

1. (2 points) Compute the probability that the r.v. $W_1 = \sqrt{\frac{5}{V}} Y$ takes on values smaller than or equal to -1.48 .
2. (2 points) If we define the r.v. $W_2 = \frac{8V}{5Z}$, find the value of k such that $P(W_2 \geq \frac{k}{5}) = 0.99$.
3. (2 points) Compute the probability that the r.v. $W_3 = \frac{(X-Y)^2}{10}$ takes on values smaller than or equal to 6.63 .