

- (1) Use the $rt(n, df)$ function in r to investigate the t-distribution for $n = 100$ and $df = n - 1$ and plot the histogram for the same.
- (2) Use the $rchisq(n, df)$ function in r to investigate the chi-square distribution with $n = 100$ and $df = 2, 10, 25$.
- (3) Generate a vector of 100 values between -6 and 6. Use the $dt()$ function in r to find the values of a t -distribution given a random variable x and degrees of freedom 1,4,10,30. Using these values plot the density function for students t -distribution with degrees of freedom 30. Also shows a comparison of probability density functions having different degrees of freedom (1,4,10,30).
- (4) Write a r-code
 - (i) To find the 95th percentile of the F -distribution with (10, 20) degrees of freedom.
 - (ii) To calculate the area under the curve for the interval $[0, 1.5]$ and the interval $[1.5, +\infty)$ of a F -curve with $v_1 = 10$ and $v_2 = 20$ (USE $pf()$).
 - (iii) To calculate the quantile for a given area (= probability) under the curve for a F -curve with $v_1 = 10$ and $v_2 = 20$ that corresponds to $q = 0.25, 0.5, 0.75$ and 0.999 . (use the $qf()$)
 - (iv) To generate 1000 random values from the F -distribution with $v_1 = 10$ and $v_2 = 20$ (use $rf()$) and plot a histogram.