

3)The sample kurtosis coefficient.

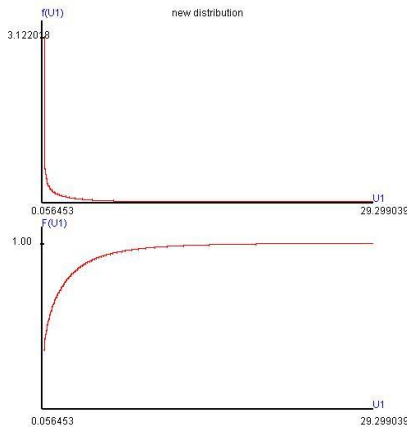
3.1) $X_1, \dots, X_n \sim^{iid} Uniform(\alpha, \beta)$,

3.1.1) $X_1, \dots, X_n \sim^{iid} Uniform(\alpha = -1, \beta = 1)$,

$$U_1 = \left(\frac{X_1 - \bar{X}}{S} \right)^4, \bar{X} = \frac{\sum_{i=1}^n X_i}{n}, S = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$$

3.1.1.1)n=10

$f_{U_1}(u_1), F_{U_1}(u_1)$

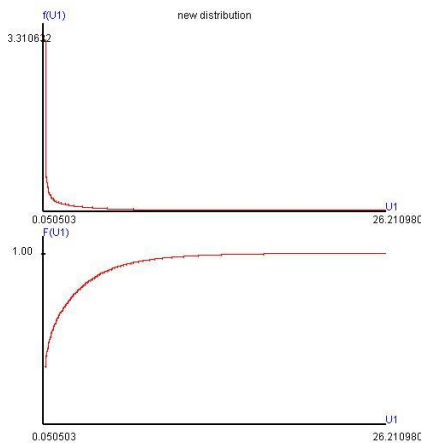


Coefficient

Mathematical Mean:	1.61369
Geometrical Mean :	0.13079
Harmonic Mean :	0.00000
Variance :	9.38235
S.D. :	3.06306
Skewed Coef. :	4.41099
Kurtosis Coef. :	33.46512
MAD :	1.83269
Range :	63.73062
Mid_range :	31.86531
Median :	0.42114
Q1 :	0.02977
Q2 :	0.42114
Q3 :	1.87332
IQR :	1.84355
C.V. :	1.89817

3.1.1.2)n=20

$f_{U_1}(u_1), F_{U_1}(u_1)$

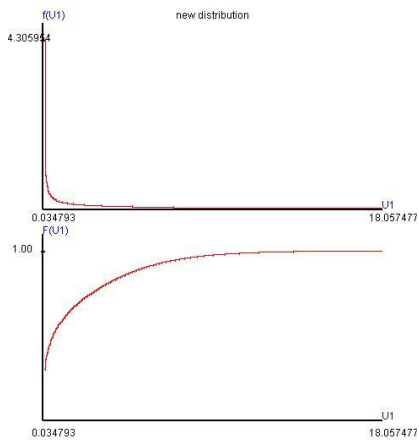


Coefficient

Mathematical Mean:	1.73378
Geometrical Mean :	0.14590
Harmonic Mean :	0.00000
Variance :	8.86340
S.D. :	2.97715
Skewed Coef. :	4.02369
Kurtosis Coef. :	35.61422
MAD :	1.92215
Range :	159.92487
Mid_range :	79.96244
Median :	0.48356
Q1 :	0.03206
Q2 :	0.48356
Q3 :	2.25181
IQR :	2.21974
C.V. :	1.71714

3.1.1.3)n=50

$$f_{U_1}(u_1), F_{U_1}(u_1)$$

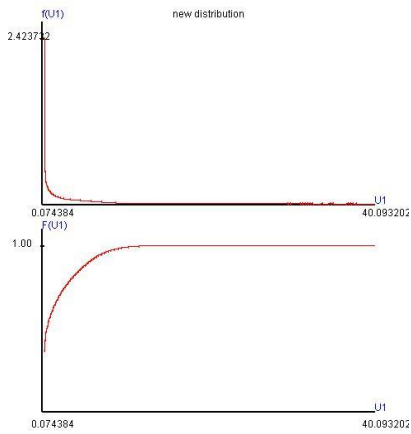


Coefficient

Mathematical Mean:	1.77837
Geometrical Mean :	0.15684
Harmonic Mean :	0.00000
Variance :	7.00714
S.D. :	2.64710
Skewed Coef. :	2.34921
Kurtosis Coef. :	10.95396
MAD :	1.93084
Range :	71.14199
Mid_range :	35.57099
Median :	0.52933
Q1 :	0.03383
Q2 :	0.52933
Q3 :	2.58071
IQR :	2.54687
C.V. :	1.48850

3.1.1.4)n=100

$$f_{U_1}(u_1), F_{U_1}(u_1)$$



Coefficient

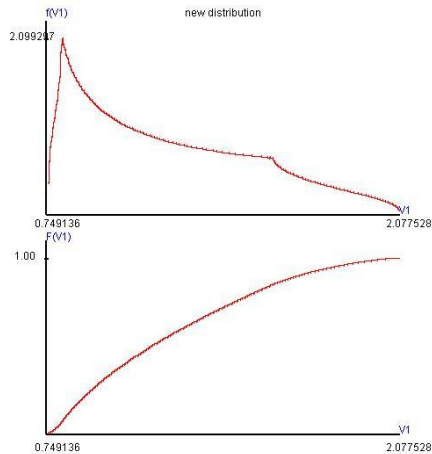
Mathematical Mean:	1.78963
Geometrical Mean :	0.16077
Harmonic Mean :	0.00000
Variance :	6.36903
S.D. :	2.52369
Skewed Coef. :	1.84134
Kurtosis Coef. :	6.56501
MAD :	1.92896
Range :	40.16759
Mid_range :	20.08379
Median :	0.54555
Q1 :	0.03450
Q2 :	0.54555
Q3 :	2.70959
IQR :	2.67509
C.V. :	1.41018

$$3.1.2) X_1, \dots, X_n \stackrel{iid}{\sim} \text{Uniform}(\alpha = -1, \beta = 1), \hat{\gamma}_2 = \frac{\sum_{i=1}^n \left(\frac{X_i - \bar{X}}{S} \right)^4}{n},$$

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}, S = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$$

3.1.2.1)n=5

$f_{T_1}(t_1), F_{T_1}(t_1)$

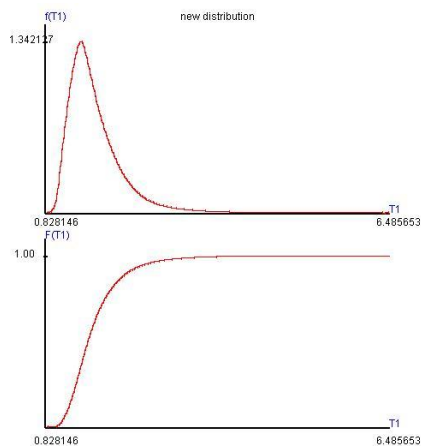


Coefficient

Mathematical Mean:	1.20868
Geometrical Mean :	1.16503
Harmonic Mean :	1.12443
Variance :	0.11097
S.D. :	0.33312
Skewed Coef. :	0.56771
Kurtosis Coef. :	2.30596
MAD :	0.28273
Range :	1.33333
Mid_range :	1.41333
Median :	1.14523
Q1 :	0.91596
Q2 :	1.14523
Q3 :	1.45734
IQR :	0.54137
C.V. :	0.27561

3.1.2.2)n=10

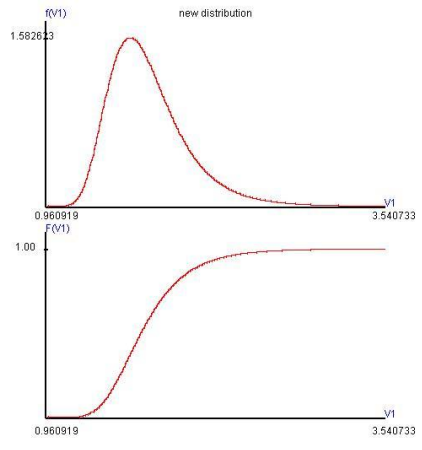
$f_{T_1}(t_1), F_{T_1}(t_1)$



Coefficient

Mathematical Mean:	1.61373
Geometrical Mean :	1.56225
Harmonic Mean :	1.51877
Variance :	0.20400
S.D. :	0.45166
Skewed Coef. :	1.97459
Kurtosis Coef. :	9.74488
MAD :	0.32601
Range :	5.67854
Mid_range :	3.65690
Median :	1.50892
Q1 :	1.31426
Q2 :	1.50892
Q3 :	1.79591
IQR :	0.48165
C.V. :	0.27988

3.1.2.3)n=20
 $f_{T_1}(t_1), F_{T_1}(t_1)$



Coefficient

Mathematical Mean:	1.73422
Geometrical Mean :	1.70874
Harmonic Mean :	1.68554
Variance :	0.09903
S.D. :	0.31469
Skewed Coef. :	1.53296
Kurtosis Coef. :	8.49885
MAD :	0.23507
Range :	8.92066
Mid_range :	5.41627
Median :	1.67925
Q1 :	1.51800
Q2 :	1.67925
Q3 :	1.88590
IQR :	0.36789
C.V. :	0.18146

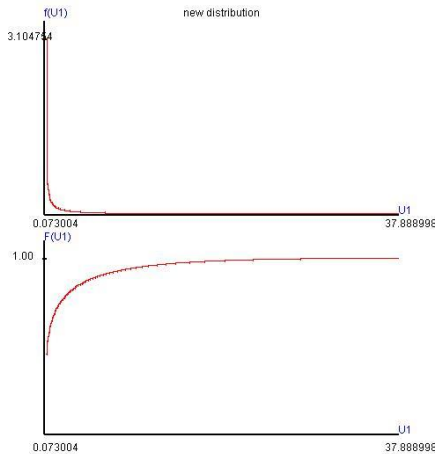
3.2) $X_1, \dots, X_n \sim \text{Noraml}(\mu, \sigma^2)$, ^{iid}

3.2.1) $X_1, \dots, X_n \sim \text{Noraml}(\mu = 5, \sigma^2 = 2^2)$, $U_1 = \left(\frac{X_1 - \bar{X}}{S} \right)^4$,

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}, S = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$$

3.2.1.1) n=10

$f_{U_1}(u_1), F_{U_1}(u_1)$

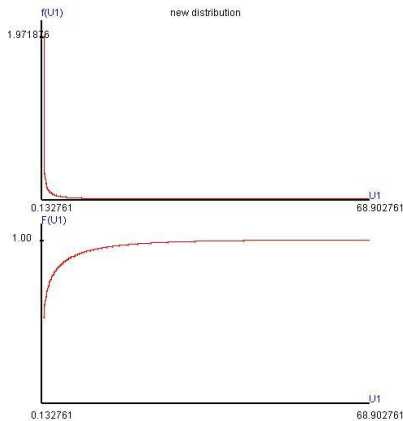


Coefficient

Mathematical Mean:	1.98846
Geometrical Mean :	0.08036
Harmonic Mean :	0.00000
Variance :	19.46546
S.D. :	4.41197
Skewed Coef. :	4.04003
Kurtosis Coef. :	24.37414
MAD :	2.57107
Range :	63.77519
Mid_range :	31.88759
Median :	0.22620
Q1 :	0.01180
Q2 :	0.22620
Q3 :	1.70712
IQR :	1.69532
C.V. :	2.21878

3.2.1.2) n=20

$f_{U_1}(u_1), F_{U_1}(u_1)$

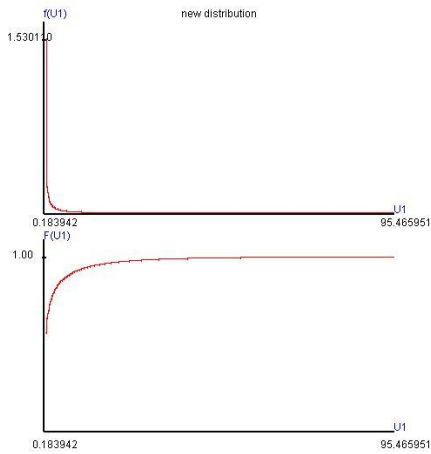


Coefficient

Mathematical Mean:	2.44909
Geometrical Mean :	0.07916
Harmonic Mean :	0.00000
Variance :	42.52701
S.D. :	6.52127
Skewed Coef. :	6.01449
Kurtosis Coef. :	58.40296
MAD :	3.29713
Range :	232.46929
Mid_range :	116.23464
Median :	0.21440
Q1 :	0.01088
Q2 :	0.21440
Q3 :	1.72716
IQR :	1.71628
C.V. :	2.66273

3.2.1.3)n=50

$$f_{U_1}(u_1), F_{U_1}(u_1)$$

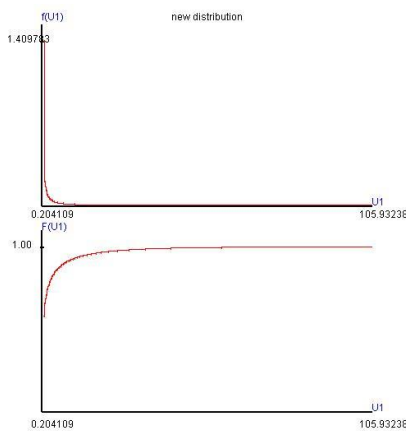


Coefficient

Mathematical Mean:	2.76754
Geometrical Mean :	0.07887
Harmonic Mean :	0.00000
Variance :	68.93142
S.D. :	8.30249
Skewed Coef. :	8.05938
Kurtosis Coef. :	117.88720
MAD :	3.80591
Range :	686.17608
Mid_range :	343.08804
Median :	0.20945
Q1 :	0.01052
Q2 :	0.20945
Q3 :	1.74075
IQR :	1.73023
C.V. :	2.99995

3.2.1.4)n=100

$$f_{U_1}(u_1), F_{U_1}(u_1)$$



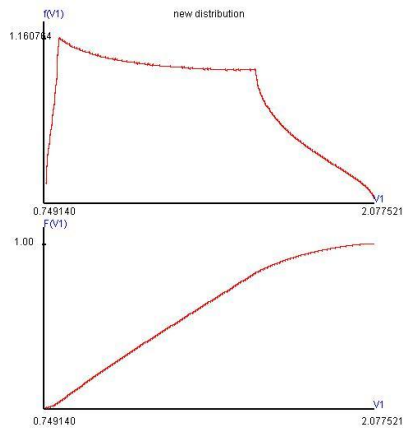
Coefficient

Mathematical Mean:	2.88073
Geometrical Mean :	0.07881
Harmonic Mean :	0.00000
Variance :	81.23106
S.D. :	9.01283
Skewed Coef. :	9.00366
Kurtosis Coef. :	155.84469
MAD :	3.98824
Range :	808.97410
Mid_range :	404.48705
Median :	0.20799
Q1 :	0.01040
Q2 :	0.20799
Q3 :	1.74461
IQR :	1.73421
C.V. :	3.12866

$$3.2.2) X_1, \dots, X_n \stackrel{iid}{\sim} \text{Noraml}(\mu = 5, \sigma^2 = 2^2), \hat{\gamma}_2 = \frac{\sum_{i=1}^n \left(\frac{X_i - \bar{X}}{S} \right)^4}{n},$$

3.2.2.1) n=5

$f_{T_1}(t_1), F_{T_1}(t_1)$

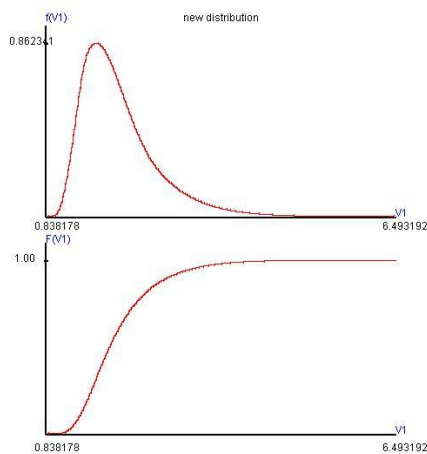


Coefficient

Mathematical Mean:	1.28000
Geometrical Mean :	1.24001
Harmonic Mean :	1.20069
Variance :	0.10238
S.D. :	0.31997
Skewed Coef. :	0.28563
Kurtosis Coef. :	2.14280
MAD :	0.27138
Range :	1.33332
Mid_range :	1.41333
Median :	1.26018
Q1 :	1.00550
Q2 :	1.26018
Q3 :	1.52522
IQR :	0.51972
C.V. :	0.24998

3.2.2.2) n=10

$f_{T_1}(t_1), F_{T_1}(t_1)$

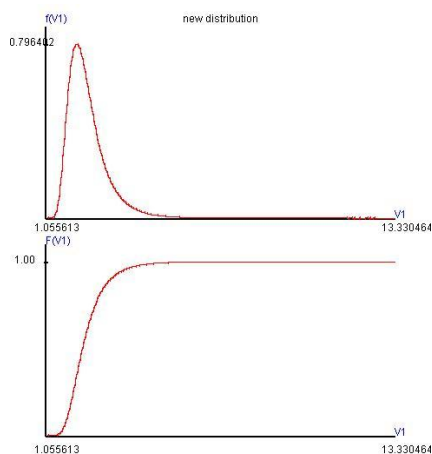


Coefficient

Mathematical Mean:	1.98821
Geometrical Mean :	1.90760
Harmonic Mean :	1.83726
Variance :	0.37377
S.D. :	0.61137
Skewed Coef. :	1.39618
Kurtosis Coef. :	5.72557
MAD :	0.46279
Range :	5.67604
Mid_range :	3.66569
Median :	1.85325
Q1 :	1.55427
Q2 :	1.85325
Q3 :	2.26945
IQR :	0.71518
C.V. :	0.30750

3.2.2.3) n=20

$f_{T_1}(t_1), F_{T_1}(t_1)$



Coefficient

Mathematical Mean:	2.44961
Geometrical Mean :	2.36886
Harmonic Mean :	2.29897
Variance :	0.47164
S.D. :	0.68676
Skewed Coef. :	1.73707
Kurtosis Coef. :	8.53724
MAD :	0.50568
Range :	12.32048
Mid_range :	7.19304
Median :	2.30272
Q1 :	1.98043
Q2 :	2.30272
Q3 :	2.74808
IQR :	0.76765
C.V. :	0.28035

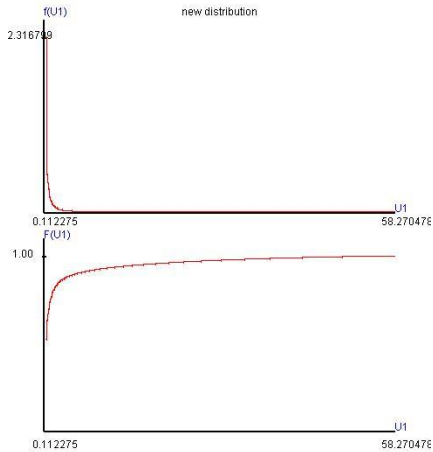
3.3) $X_1, \dots, X_n \sim \overset{iid}{\text{Shifted_exp_ponential}}(\lambda, c)$,

3.3.1) $X_1, \dots, X_n \overset{iid}{\sim} \text{Shifted_exp_ponential}(\lambda = 5, c = 1)$, $U_1 = \left(\frac{X_1 - \bar{X}}{S} \right)^4$,

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}, S = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$$

3.3.1.1) n=10

$f_{U_1}(u_1), F_{U_1}(u_1)$

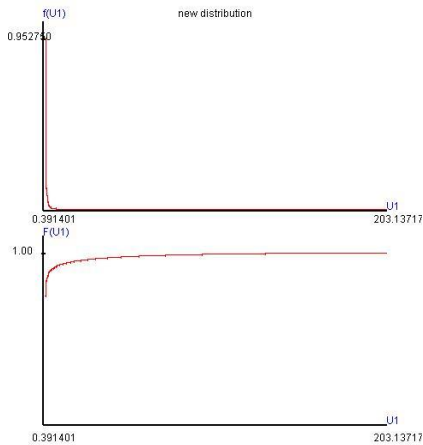


Coefficient

Mathematical Mean:	2.57182
Geometrical Mean :	0.08241
Harmonic Mean :	0.00000
Variance :	57.78902
S.D. :	7.60191
Skewed Coef. :	4.43248
Kurtosis Coef. :	24.43581
MAD :	3.78429
Range :	65.51815
Mid_range :	32.75908
Median :	0.19594
Q1 :	0.01685
Q2 :	0.19594
Q3 :	0.96846
IQR :	0.95160
C.V. :	2.95585

3.3.1.2) n=20

$f_{U_1}(u_1), F_{U_1}(u_1)$

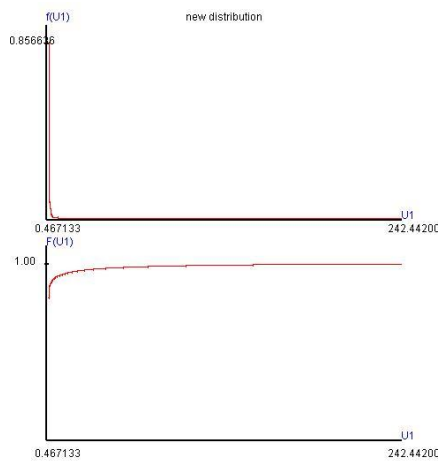


Coefficient

Mathematical Mean:	4.02018
Geometrical Mean :	0.07305
Harmonic Mean :	0.00000
Variance :	302.75543
S.D. :	17.39987
Skewed Coef. :	7.43137
Kurtosis Coef. :	70.54922
MAD :	6.47660
Range :	315.50679
Mid_range :	157.75339
Median :	0.17865
Q1 :	0.01446
Q2 :	0.17865
Q3 :	0.80356
IQR :	0.78910
C.V. :	4.32813

3.3.1.3)n=50

$$f_{U_1}(u_1), F_{U_1}(u_1)$$

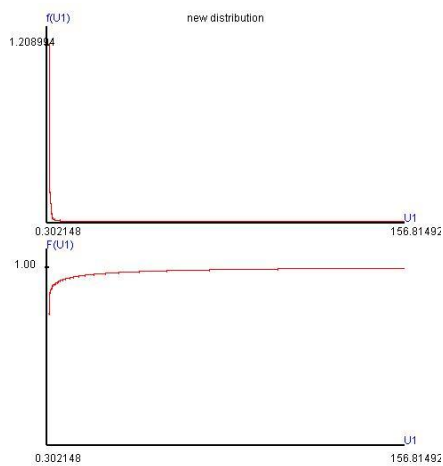


Coefficient

Mathematical Mean:	5.88636
Geometrical Mean :	0.06652
Harmonic Mean :	0.00000
Variance :	1424.81312
S.D. :	37.74670
Skewed Coef. :	14.03918
Kurtosis Coef. :	280.40011
MAD :	10.01476
Range :	2023.94023
Mid_range :	1011.97012
Median :	0.16949
Q1 :	0.01320
Q2 :	0.16949
Q3 :	0.69869
IQR :	0.68550
C.V. :	6.41257

3.3.1.4)n=100

$$f_{U_1}(u_1), F_{U_1}(u_1)$$



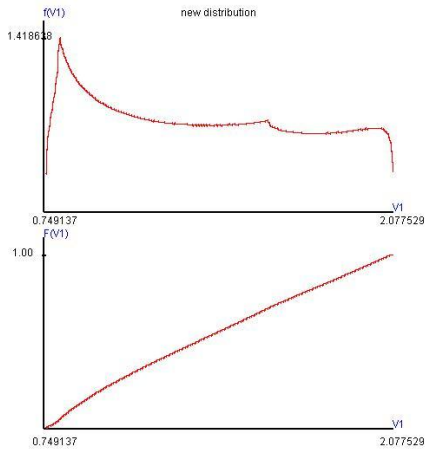
Coefficient

Mathematical Mean:	7.02040
Geometrical Mean :	0.06416
Harmonic Mean :	0.00000
Variance :	3226.56470
S.D. :	56.80286
Skewed Coef. :	22.04676
Kurtosis Coef. :	776.20221
MAD :	12.16666
Range :	6721.53138
Mid_range :	3360.76569
Median :	0.16656
Q1 :	0.01279
Q2 :	0.16656
Q3 :	0.66348
IQR :	0.65069
C.V. :	8.09112

3.3.2) $X_1, \dots, X_n \stackrel{iid}{\sim} \text{Shifted_exp_onential}(\lambda = 5, c = 1), \hat{\gamma}_2 = \frac{\sum_{i=1}^n \left(\frac{X_i - \bar{X}}{S} \right)^4}{n}$,

3.3.2.1) n=5

$f_{T_1}(t_1), F_{T_1}(t_1)$

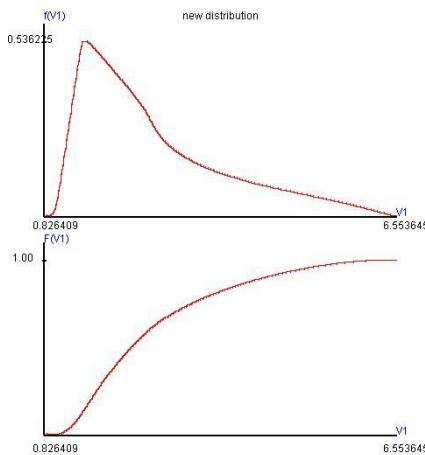


Coefficient

Mathematical Mean:	1.35784
Geometrical Mean :	1.30028
Harmonic Mean :	1.24345
Variance :	0.15311
S.D. :	0.39129
Skewed Coef. :	0.16714
Kurtosis Coef. :	1.77242
MAD :	0.34084
Range :	1.33333
Mid_range :	1.41333
Median :	1.33478
Q1 :	1.00039
Q2 :	1.33478
Q3 :	1.69110
IQR :	0.69070
C.V. :	0.28817

3.3.2.2) n=10

$f_{T_1}(t_1), F_{T_1}(t_1)$

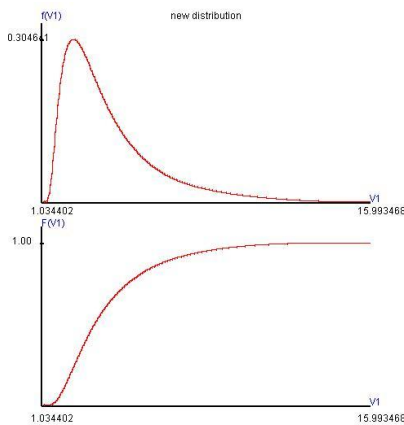


Coefficient

Mathematical Mean:	2.57273
Geometrical Mean :	2.33964
Harmonic Mean :	2.14484
Variance :	1.38589
S.D. :	1.17724
Skewed Coef. :	1.04012
Kurtosis Coef. :	3.33323
MAD :	0.94586
Range :	5.74853
Mid_range :	3.69003
Median :	2.22742
Q1 :	1.66151
Q2 :	2.22742
Q3 :	3.21170
IQR :	1.55018
C.V. :	0.45758

3.3.2.3) n=20

$f_{T_1}(t_1), F_{T_1}(t_1)$



Coefficient

Mathematical Mean:	4.01878
Geometrical Mean :	3.56566
Harmonic Mean :	3.20757
Variance :	4.59790
S.D. :	2.14427
Skewed Coef. :	1.53326
Kurtosis Coef. :	5.55005
MAD :	1.62172
Range :	15.01468
Mid_range :	8.51393
Median :	3.40111
Q1 :	2.48208
Q2 :	3.40111
Q3 :	4.91003
IQR :	2.42796
C.V. :	0.53356