

Chapter eight  
The probability model designed

1)The probability distribution from the mathematical equation.

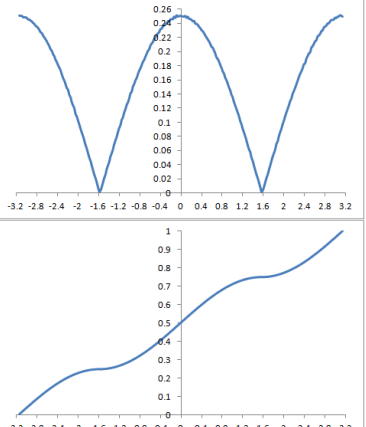
1.1)

$$g(x_1) = |\cos(x_1)|, -\pi < x_1 < \pi$$

$$\int_{-\pi}^{\pi} g(x_1) dx_1 = \int_{-\pi}^{\pi} |\cos(x_1)| dx_1 = 4.0936469124540583$$

$$f(x_1) = \frac{|\cos(x_1)|}{4.0936469124540583}, -\pi < x_1 < \pi$$

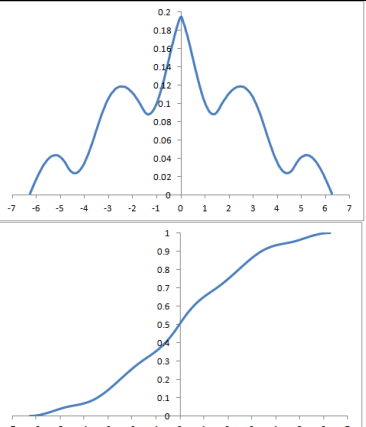
$$\int_{-\pi}^{\pi} f(x_1) dx_1 = 1$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00050 Geometrical Mean none Harmonic Mean : none Variance : 3.60971 S.D. : 1.89992 Skewed Coef. : -0.00022 Kurtosis Coef. : 1.90330 MAD : 1.57099 Range : 6.28306 Mid_range: 0.00006 Median : 0.00049 Q1: -1.55486 Q2: 0.00049 Q3: 1.60220 IQR : 3.15706 C.V. : none

1.1.1)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

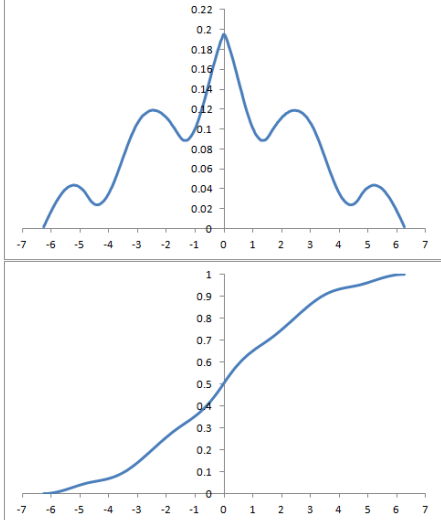
$$Y = X_1 + X_2$$

Pdf and df	Coefficient
	Mathematical Mean: -0.00016 Geometrical Mean: none Harmonic Mean none Variance : 7.21869 S.D. : 2.68676 Skewed Coef. : -0.00026 Kurtosis Coef. : 2.45188 MAD : 2.17815 Range : 12.56588 Mid_range : 0.00024 Median : 0.00000 Q1: -2.04287 Q2: 0.00000 Q3: 2.04308 IQR : 4.08595 C.V. : none

1.1.2)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

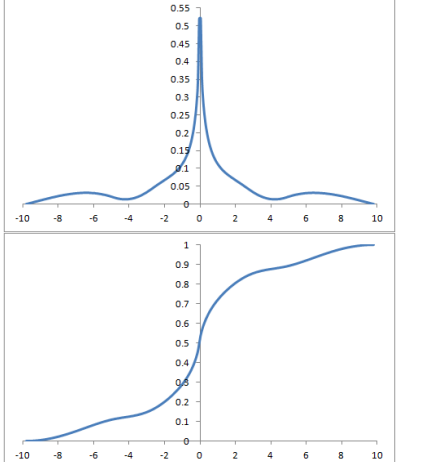
$$Y = X_1 - X_2$$

Pdf and df	Coefficient																																
	<table> <tr><td>Mathematical Mean:</td><td>-0.00011</td></tr> <tr><td>Geometrical Mean:</td><td>none</td></tr> <tr><td>Harmonic Mean :</td><td>none</td></tr> <tr><td>Variance :</td><td>7.21819</td></tr> <tr><td>S.D. :</td><td>2.68667</td></tr> <tr><td>Skewed Coef. :</td><td>0.00014</td></tr> <tr><td>Kurtosis Coef. :</td><td>2.45159</td></tr> <tr><td>MAD :</td><td>2.17815</td></tr> <tr><td>Range :</td><td>12.56539</td></tr> <tr><td>Mid_range :</td><td>-0.00012</td></tr> <tr><td>Median :</td><td>-0.00014</td></tr> <tr><td>Q1:</td><td>-2.04343</td></tr> <tr><td>Q2:</td><td>-0.00014</td></tr> <tr><td>Q3</td><td>2.04303</td></tr> <tr><td>IQR :</td><td>4.08646</td></tr> <tr><td>C.V. :</td><td>none</td></tr> </table>	Mathematical Mean:	-0.00011	Geometrical Mean:	none	Harmonic Mean :	none	Variance :	7.21819	S.D. :	2.68667	Skewed Coef. :	0.00014	Kurtosis Coef. :	2.45159	MAD :	2.17815	Range :	12.56539	Mid_range :	-0.00012	Median :	-0.00014	Q1:	-2.04343	Q2:	-0.00014	Q3	2.04303	IQR :	4.08646	C.V. :	none
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C.V. :	none																																

1.1.3)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

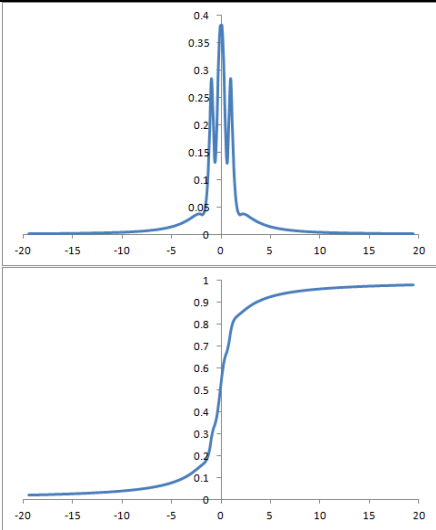
$$Y = X_1 \times X_2$$

Pdf and df	Coefficient																																
	<table> <tr><td>Mathematical Mean:</td><td>-0.00044</td></tr> <tr><td>Geometrical Mean:</td><td>none</td></tr> <tr><td>Harmonic Mean :</td><td>none</td></tr> <tr><td>Variance :</td><td>13.02497</td></tr> <tr><td>S.D. :</td><td>3.60901</td></tr> <tr><td>Skewed Coef. :</td><td>-0.00004</td></tr> <tr><td>Kurtosis Coef. :</td><td>3.62319</td></tr> <tr><td>MAD :</td><td>2.46741</td></tr> <tr><td>Range :</td><td>19.73461</td></tr> <tr><td>Mid_range :</td><td>-0.00000</td></tr> <tr><td>Median :</td><td>-0.00000</td></tr> <tr><td>Q1:</td><td>1.34489</td></tr> <tr><td>Q2:</td><td>-0.00000</td></tr> <tr><td>Q3</td><td>1.34333</td></tr> <tr><td>IQR :</td><td>2.68822</td></tr> <tr><td>C.V. :</td><td>none</td></tr> </table>	Mathematical Mean:	-0.00044	Geometrical Mean:	none	Harmonic Mean :	none	Variance :	13.02497	S.D. :	3.60901	Skewed Coef. :	-0.00004	Kurtosis Coef. :	3.62319	MAD :	2.46741	Range :	19.73461	Mid_range :	-0.00000	Median :	-0.00000	Q1:	1.34489	Q2:	-0.00000	Q3	1.34333	IQR :	2.68822	C.V. :	none
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1.1.4)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

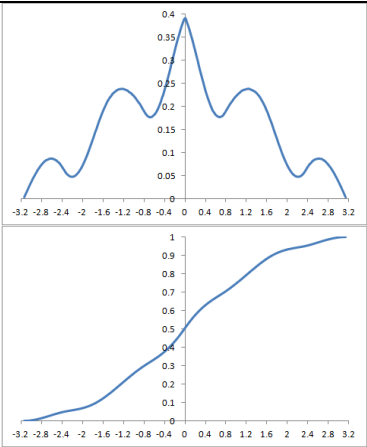
$$Y = X_1/X_2$$

Pdf and df	Coefficient
	Mathematical Mean: 0.01925 Geometrical Mean: none Harmonic Mean : none Variance : 24045.37273 S.D. : 155.06570 Skewed Coef. : 5.72612 Kurtosis Coef. : 14579.24373 MAD : 7.74534 Range : 120769.82916 Mid_range : 34653.38347 Median : -0.00009 Q1: -1.00000 Q2: -0.00009 Q3: 0.99968 IQR : 1.99968 C.V. : 8056.21641

1.1.5)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

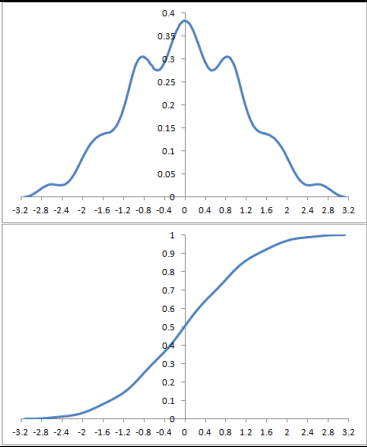
$$Y = \bar{X}$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00009 Geometrical Mean: none Harmonic Mean : none Variance : 1.80399 S.D. : 1.34313 Skewed Coef. : -0.00009 Kurtosis Coef. : 2.45214 MAD : 1.08887 Range : 6.28233 Mid_range : 0.00006 Median : 0.00013 Q1: -1.02126 Q2: 0.00013 Q3: 1.02142 IQR : 2.04268 C.V. : none

1.1.6)

$$X_1, X_2, X_3 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

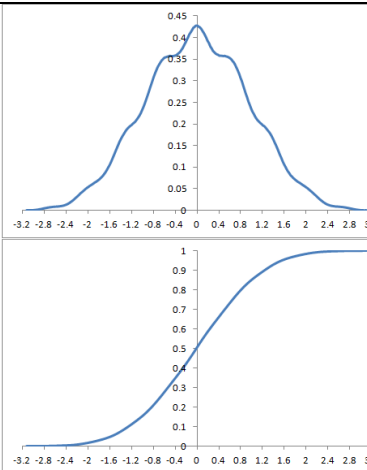
$$Y = \bar{X}$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00018 Geometrical Mean: none Harmonic Mean : none Variance : 1.20307 S.D. : 1.09684 Skewed Coef. : 0.00011 Kurtosis Coef. : 2.63411 MAD : 0.88752 Range : 6.27415 Mid_range : 0.00090 Median : 0.00002 Q1: -0.78711 Q2: 0.00002 Q3 0.78750 IQR : 1.57461 C.V. : none

1.1.7)

$$X_1, X_2, X_3, X_4 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

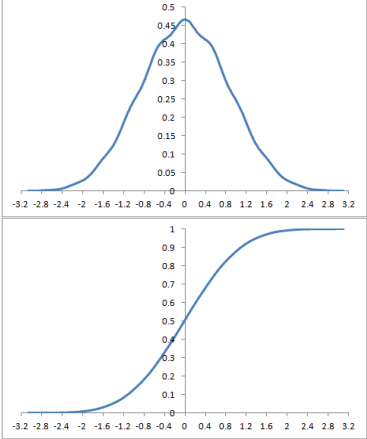
$$Y = \bar{X}$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00009 Geometrical Mean: none Harmonic Mean : none Variance : 0.90258 S.D. : 0.95004 Skewed Coef. : -0.00005 Kurtosis Coef. : 2.72516 MAD : 0.76654 Range : 6.23798 Mid_range : -0.00756 Median : 0.00008 Q1: -0.66198 Q2: 0.00008 Q3 0.66212 IQR : 1.32410 C.V. : none

1.1.8)

$$X_1, X_2, X_3, X_4, X_5 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

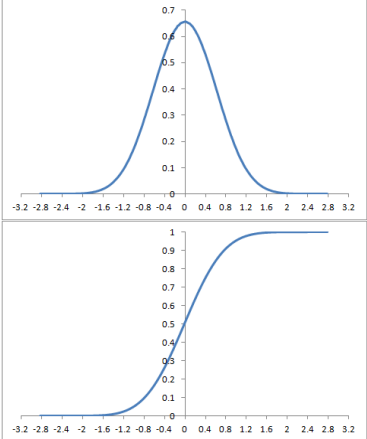
$$Y = \bar{X}$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00010 Geometrical Mean: none Harmonic Mean : none Variance : 0.72172 S.D. : 0.84954 Skewed Coef. : 0.00003 Kurtosis Coef. : 2.78013 MAD : 0.68410 Range : 6.17028 Mid_range : 0.01400 Median : 0.00008 Q1: -0.58602 Q2: 0.00008 Q3 0.58632 IQR : 1.17235 C.V. : none

1.1.9)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

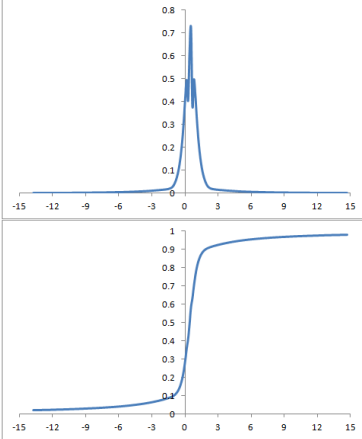
$$Y = \bar{X}$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00009 Geometrical Mean: none Harmonic Mean : none Variance : 0.36091 S.D. : 0.60076 Skewed Coef. : 0.00002 Kurtosis Coef. : 2.88997 MAD : 0.48158 Range : 5.61974 Mid_range : -0.02105 Median : 0.00015 Q1: -0.41000 Q2: 0.00015 Q3 0.41012 IQR : 0.82013 C.V. : none

1.1.10)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

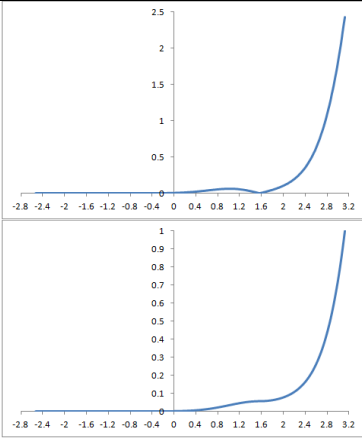
$$Y = \frac{X_1}{X_1 + X_2}$$

Pdf and df	Coefficient
	Mathematical Mean: 0.48615 Geometrical Mean: none Harmonic Mean : none Variance : 41658.91361 S.D. : 204.10515 Skewed Coef. : 10.57631 Kurtosis Coef. : 92093.45153 MAD : 5.98883 Range : 198796.61573 Mid_range : 334.56694 Median : 0.50000 Q1: 0.00012 Q2: 0.50000 Q3: 0.99992 IQR : 0.99979 C.V. : 419.83850

1.1.11)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

$$Y = \text{Max}(X_1, X_2, \dots, X_{10})$$

Pdf and df	Coefficient
	Mathematical Mean: 2.69917 Geometrical Mean: none Harmonic Mean : none Variance : 0.28563 S.D. : 0.53444 Skewed Coef. : -2.49753 Kurtosis Coef. : 9.76327 MAD : 0.35446 Range : 5.67719 Mid_range : 0.30300 Median : 2.87046 Q1: 2.59743 Q2: 2.87046 Q3: 3.02794 IQR : 0.43051 C.V. : 0.19800

1.1.12)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

$$Y = \text{Min}(X_1, X_2, \dots, X_{10})$$

Pdf and df	Coefficient
	Mathematical Mean: -2.69893
	Geometrical Mean: none
	Harmonic Mean : none
	Variance : 0.28584
	S.D. : 0.53464
	Skewed Coef. : 2.49745
	Kurtosis Coef. : 9.76146
	MAD : 0.35458
	Range : 5.61199
	Mid_range : -0.33547
	Median : -2.87033
	Q1: -3.02782
	Q2: -2.87033
	Q3 -2.59715
IQR : 0.43068	
C.V. : none	

1.1.13)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

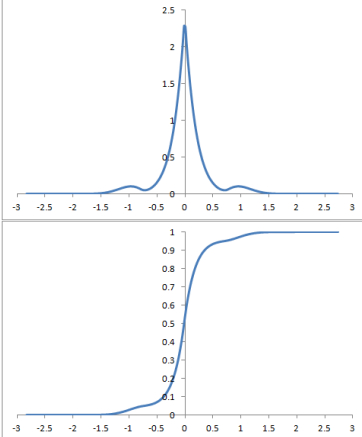
$$Y = \text{Median}(X_1, X_2, \dots, X_{10})$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00011
	Geometrical Mean: none
	Harmonic Mean : none
	Variance : 0.62039
	S.D. : 0.78765
	Skewed Coef. : 0.00017
	Kurtosis Coef. : 4.24882
	MAD : 0.57986
	Range : 6.15611
	Mid_range : 0.01791
	Median : 0.00006
	Q1: -0.42127
	Q2: 0.00006
	Q3 0.42142
IQR : 0.84268	
C.V. : none	

1.1.14)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

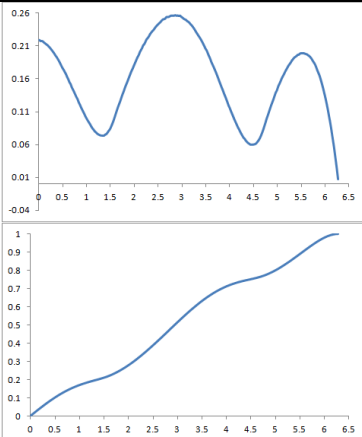
$$Y = \frac{\text{Max}(X_1, X_2, \dots, X_{10}) + \text{Min}(X_1, X_2, \dots, X_{10})}{2} = \text{Mid\_range}$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00010 Geometrical Mean: none Harmonic Mean : none Variance : 0.15604 S.D. : 0.39502 Skewed Coef. : -0.00060 Kurtosis Coef. : 6.18957 MAD : 0.25426 Range : 5.58801 Mid_range : -0.04239 Median : 0.00012 Q1: -0.14526 Q2: 0.00012 Q3: 0.14548 IQR : 0.29074 C.V. : none

1.1.15)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

$$Y = \text{Max}(X_1, X_2, \dots, X_{10}) - \text{Min}(X_1, X_2, \dots, X_{10})$$

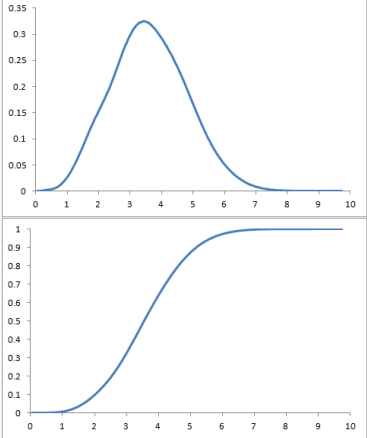
Pdf and df	Coefficient
	Mathematical Mean: 3.03236 Geometrical Mean: 2.18826 Harmonic Mean : 0.43774 Variance : 3.03685 S.D. : 1.74266 Skewed Coef. : 0.04661 Kurtosis Coef. : 2.00723 MAD : 1.43860 Range : 6.28294 Mid_range : 3.14159 Median : 2.94658 Q1: 1.82746 Q2: 2.94658 Q3: 4.47284 IQR : 2.64538 C.V. : 0.57469



1.1.16)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

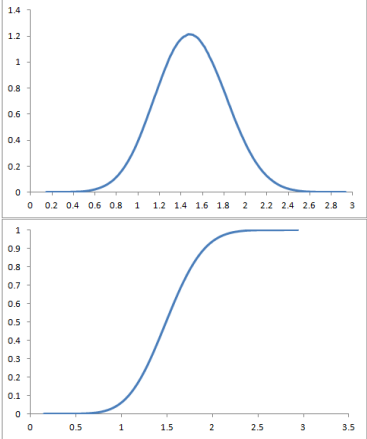
$$Y = \frac{\sum_{i=1}^{10} (X_i - \bar{X})^2}{9}$$

Pdf and df	Coefficient
	Mathematical Mean: 3.60904 Geometrical Mean: 3.38295 Harmonic Mean : 3.11317 Variance : 1.46614 S.D. : 1.21084 Skewed Coef. : 0.19365 Kurtosis Coef. : 2.79737 MAD : 0.97554 Range : 9.72804 Mid_range : 4.88667 Median : 3.56810 Q1: 2.75624 Q2: 3.56810 Q3 4.42814 IQR : 1.67190 C.V. : 0.33550

1.1.17)

$$X_1, X_2, \dots, X_{10} \stackrel{i.i.d.}{\sim} f(x) = \frac{|\cos(x)|}{4.0936469124540583}, -\pi < x < \pi$$

$$Y = \frac{\sum_{i=1}^{10} |X_i - \bar{X}|}{10}$$

Pdf and df	Coefficient
	Mathematical Mean: 1.49588 Geometrical Mean: 1.45878 Harmonic Mean : 1.41871 Variance : 0.10508 S.D. : 0.32415 Skewed Coef. : 0.05814 Kurtosis Coef. : 2.88895 MAD : 0.25989 Range : 2.80015 Mid_range : 1.53969 Median : 1.49185 Q1: 1.27279 Q2: 1.49185 Q3 1.71554 IQR : 0.44275 C.V. : 0.21670

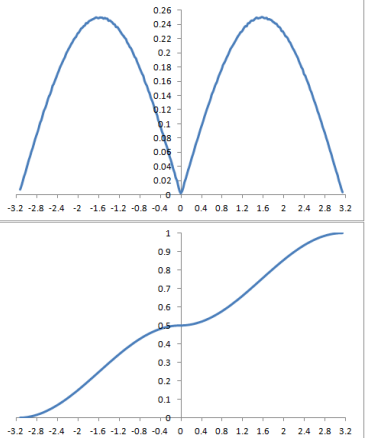
1.2)

$$g(x_1) = |\sin(x_1)|, -\pi < x_1 < \pi$$

$$\int_{-\pi}^{\pi} g(x_1) dx_1 = \int_{-\pi}^{\pi} |\sin(x_1)| dx_1 = 4.0000000054625734$$

$$f(x_1) = \frac{|\sin(x_1)|}{4.0000000054625734}, -\pi < x_1 < \pi$$

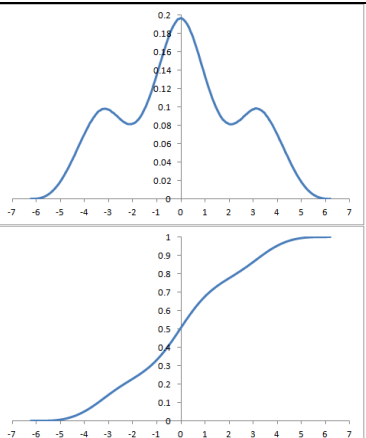
$$\int_{-\pi}^{\pi} f(x_1) dx_1 = 1$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00024 Geometrical Mean: none Harmonic Mean : none Variance : 2.93484 S.D. : 1.71314 Skewed Coef. : -0.00020 Kurtosis Coef. : 1.56583 MAD : 1.57083 Range : 6.26774 Mid_range: 0.00790 Median : 0.02209 Q1: -1.57056 Q2: 0.02209 Q3: 1.57079 IQR : 3.14135 C.V. : none

1.2.1)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\sin(x)|}{4.0000000054625734}, -\pi < x < \pi$$

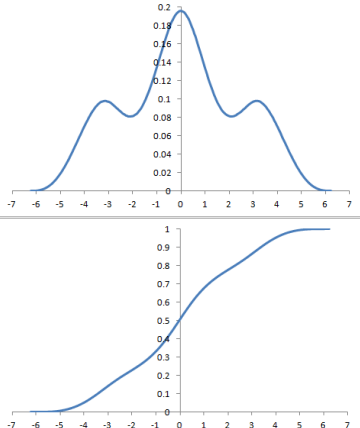
$$Y = X_1 + X_2$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00065 Geometrical Mean: none Harmonic Mean : none Variance : 5.87028 S.D. : 2.42287 Skewed Coef. : -0.00029 Kurtosis Coef. : 2.28292 MAD : 1.96364 Range : 12.46828 Mid_range: -0.00486 Median : 0.00073 Q1: -1.71815 Q2: 0.00073 Q3: 1.72027 IQR : 3.43842 C.V. : none

1.2.2)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\sin(x)|}{4.0000000054625734}, -\pi < x < \pi$$

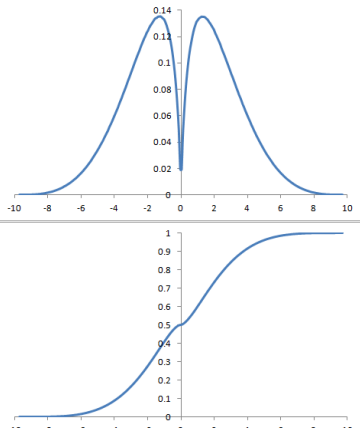
$$Y = X_1 - X_2$$

Pdf and df	Coefficient																																
	<table> <tr><td>Mathematical Mean:</td><td>-0.00021</td></tr> <tr><td>Geometrical Mean:</td><td>none</td></tr> <tr><td>Harmonic Mean:</td><td>none</td></tr> <tr><td>Variance :</td><td>5.86954</td></tr> <tr><td>S.D. :</td><td>2.42271</td></tr> <tr><td>Skewed Coef. :</td><td>0.00003</td></tr> <tr><td>Kurtosis Coef. :</td><td>2.28295</td></tr> <tr><td>MAD :</td><td>1.96345</td></tr> <tr><td>Range :</td><td>12.49243</td></tr> <tr><td>Mid_range :</td><td>0.00572</td></tr> <tr><td>Median :</td><td>-0.00020</td></tr> <tr><td>Q1:</td><td>-1.71887</td></tr> <tr><td>Q2:</td><td>-0.00020</td></tr> <tr><td>Q3:</td><td>1.71873</td></tr> <tr><td>IQR :</td><td>3.43760</td></tr> <tr><td>C.V. :</td><td>none</td></tr> </table>	Mathematical Mean:	-0.00021	Geometrical Mean:	none	Harmonic Mean:	none	Variance :	5.86954	S.D. :	2.42271	Skewed Coef. :	0.00003	Kurtosis Coef. :	2.28295	MAD :	1.96345	Range :	12.49243	Mid_range :	0.00572	Median :	-0.00020	Q1:	-1.71887	Q2:	-0.00020	Q3:	1.71873	IQR :	3.43760	C.V. :	none
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1.2.3)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\sin(x)|}{4.0000000054625734}, -\pi < x < \pi$$

$$Y = X_1 \times X_2$$

Pdf and df	Coefficient																																
	<table> <tr><td>Mathematical Mean:</td><td>0.00003</td></tr> <tr><td>Geometrical Mean:</td><td>none</td></tr> <tr><td>Harmonic Mean:</td><td>none</td></tr> <tr><td>Variance :</td><td>8.61451</td></tr> <tr><td>S.D. :</td><td>2.93505</td></tr> <tr><td>Skewed Coef. :</td><td>0.00001</td></tr> <tr><td>Kurtosis Coef. :</td><td>2.45151</td></tr> <tr><td>MAD :</td><td>2.46769</td></tr> <tr><td>Range :</td><td>19.50286</td></tr> <tr><td>Mid_range :</td><td>-0.00001</td></tr> <tr><td>Median :</td><td>-0.00031</td></tr> <tr><td>Q1:</td><td>-2.17912</td></tr> <tr><td>Q2:</td><td>-0.00031</td></tr> <tr><td>Q3:</td><td>2.17907</td></tr> <tr><td>IQR :</td><td>4.35819</td></tr> <tr><td>C.V. :</td><td>none</td></tr> </table>	Mathematical Mean:	0.00003	Geometrical Mean:	none	Harmonic Mean:	none	Variance :	8.61451	S.D. :	2.93505	Skewed Coef. :	0.00001	Kurtosis Coef. :	2.45151	MAD :	2.46769	Range :	19.50286	Mid_range :	-0.00001	Median :	-0.00031	Q1:	-2.17912	Q2:	-0.00031	Q3:	2.17907	IQR :	4.35819	C.V. :	none
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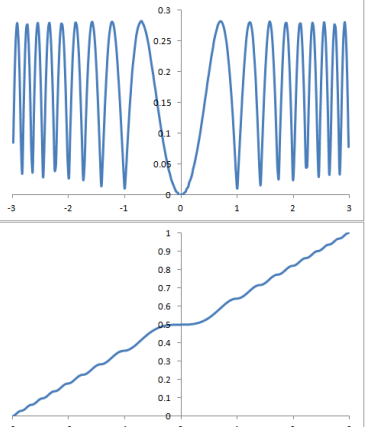
1.3)

$$g(x_1) = |\sin(x_1^2 \times \pi)|, -3 < x_1 < 3$$

$$\int_{-3}^3 g(x_1) dx_1 = \int_{-3}^3 |\sin(x_1^2 \times \pi)| dx_1 = 3.551080755523031$$

$$f(x_1) = \frac{|\sin(x_1^2 \times \pi)|}{3.551080755523031}, -3 < x_1 < 3$$

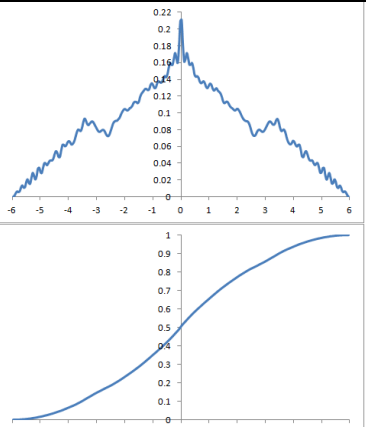
$$\int_{-3}^3 f(x_1) dx_1 = 1$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00038 Geometrical Mean: none Harmonic Mean : none Variance : 3.23183 S.D. : 1.79773 Skewed Coef. : -0.00015 Kurtosis Coef. : 1.66717 MAD : 1.61355 Range : 5.99181 Mid_range: 0.00070 Median : 0.05915 Q1: -1.59736 Q2: 0.05915 Q3: 1.59780 IQR : 3.19515 C.V. : none

1.3.1)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\sin(x^2 \times \pi)|}{3.979985000578701}, -3 < x < 3$$

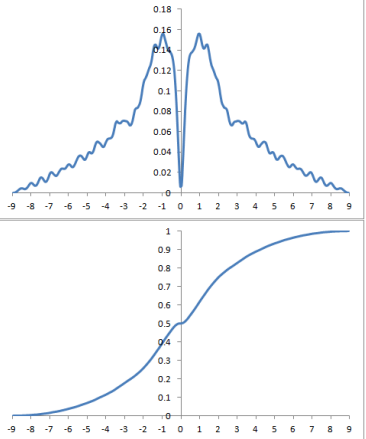
$$Y = X_1 + X_2$$

Pdf and df	Coefficient
	Mathematical Mean: -0.00007 Geometrical Mean: none Harmonic Mean : none Variance : 6.46423 S.D. : 2.54249 Skewed Coef. : -0.00013 Kurtosis Coef. : 2.33337 MAD : 2.07091 Range : 11.97914 Mid_range : -0.00224 Median : -0.00011 Q1: -1.80942 Q2: -0.00011 Q3: 1.81006 IQR : 3.61948 C.V. : none

1.3.2)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{\sin(x^2 \times \pi)}{3.979985000578701}, -3 < x < 3$$

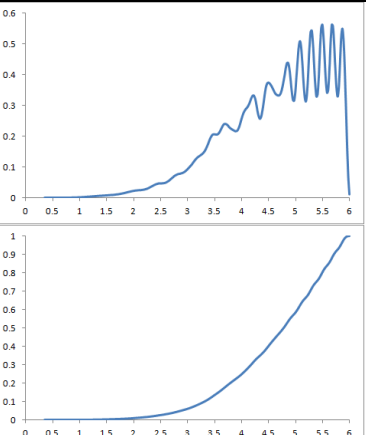
$$Y = X_1 \times X_2$$

Pdf and df	Coefficient
	Mathematical Mean: -0.00068 Geometrical Mean: none Harmonic Mean: none Variance: 10.44269 S.D.: 3.23152 Skewed Coef.: -0.00004 Kurtosis Coef.: 2.77984 MAD: 2.60316 Range: 17.94442 Mid_range: 0.00000 Median: 0.00000 Q1: -2.04139 Q2: 0.00000 Q3: 2.03936 IQR: 4.08075 C.V.: none

1.3.3)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{\sin(x^2 \times \pi)}{3.979985000578701}, -3 < x < 3$$

$$Y = \sqrt{9 - X_1^2} + \sqrt{9 - X_2^2}$$

Pdf and df	Coefficient
	Mathematical Mean: 4.61673 Geometrical Mean: 4.50286 Harmonic Mean: 4.36118 Variance: 0.88069 S.D.: 0.93845 Skewed Coef.: -0.74496 Kurtosis Coef.: 3.09215 MAD: 0.76899 Range: 5.66930 Mid_range: 3.16498 Median: 4.78065 Q1: 4.00850 Q2: 4.78065 Q3: 5.38438 IQR: 1.37589 C.V.: 0.20327

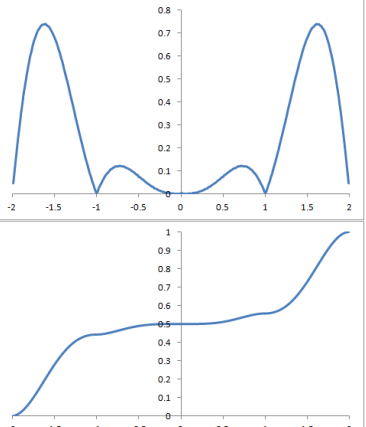
1.4)

$$g(x_1) = |x_1^2 \times \sin(x_1 \times \pi)|, -2 < x_1 < 2$$

$$\int_{-2}^2 g(x_1) dx_1 = \int_{-3}^3 |x_1^2 \times \sin(x_1 \times \pi)| dx_1 = 3.3036940995521178$$

$$f(x_1) = \frac{|x_1^2 \times \sin(x_1 \times \pi)|}{3.3036940995521178}, -2 < x_1 < 2$$

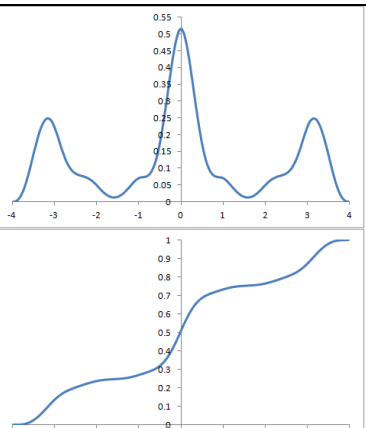
$$\int_{-2}^2 f(x_1) dx_1 = 1$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00015 Geometrical Mean: none Harmonic Mean : none Variance : 2.25268 S.D. : 1.50089 Skewed Coef. : -0.00020 Kurtosis Coef. : 1.15681 MAD : 1.45838 Range : 3.99198 Mid_range: -0.00000 Median : 0.10678 Q1: -1.53424 Q2: 0.10678 Q3: 1.53428 IQR : 3.06851 C.V. : none

1.4.1)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|x^2 \times \sin(x \times \pi)|}{3.3036940995521178}, -2 < x < 2$$

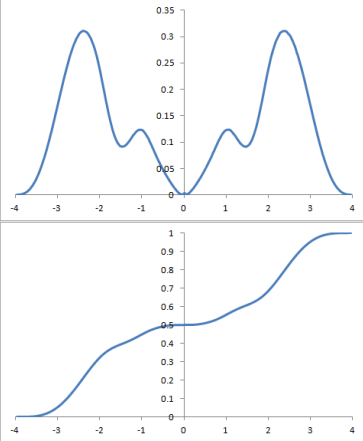
$$Y = X_1 + X_2$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00005 Geometrical Mean: none Harmonic Mean : none Variance : 4.50586 S.D. : 2.12270 Skewed Coef. : -0.00006 Kurtosis Coef. : 2.07823 MAD : 1.64628 Range : 7.96761 Mid_range: 0.00155 Median : -0.00000 Q1: -1.38778 Q2: -0.00000 Q3: 1.38940 IQR : 2.77717 C.V. : none

1.4.2)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|x^2 \times \sin(x \times \pi)|}{3.3036940995521178}, -2 < x < 2$$

$$Y = X_1 \times X_2$$

Pdf and df	Coefficient																																
	<table> <tr> <td>Mathematical Mean:</td> <td>0.00009</td> </tr> <tr> <td>Geometrical Mean:</td> <td>none</td> </tr> <tr> <td>Harmonic Mean</td> <td>none</td> </tr> <tr> <td>Variance :</td> <td>5.07453</td> </tr> <tr> <td>S.D. :</td> <td>2.25267</td> </tr> <tr> <td>Skewed Coef. :</td> <td>-0.00005</td> </tr> <tr> <td>Kurtosis Coef. :</td> <td>1.33827</td> </tr> <tr> <td>MAD :</td> <td>2.12685</td> </tr> <tr> <td>Range :</td> <td>7.95404</td> </tr> <tr> <td>Mid_range :</td> <td>-0.00108</td> </tr> <tr> <td>Median :</td> <td>0.00000</td> </tr> <tr> <td>Q1</td> <td>-2.24985</td> </tr> <tr> <td>Q2:</td> <td>0.00000</td> </tr> <tr> <td>Q3:</td> <td>2.24998</td> </tr> <tr> <td>IQR :</td> <td>4.49983</td> </tr> <tr> <td>C.V. :</td> <td>none</td> </tr> </table>	Mathematical Mean:	0.00009	Geometrical Mean:	none	Harmonic Mean	none	Variance :	5.07453	S.D. :	2.25267	Skewed Coef. :	-0.00005	Kurtosis Coef. :	1.33827	MAD :	2.12685	Range :	7.95404	Mid_range :	-0.00108	Median :	0.00000	Q1	-2.24985	Q2:	0.00000	Q3:	2.24998	IQR :	4.49983	C.V. :	none
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1.5)

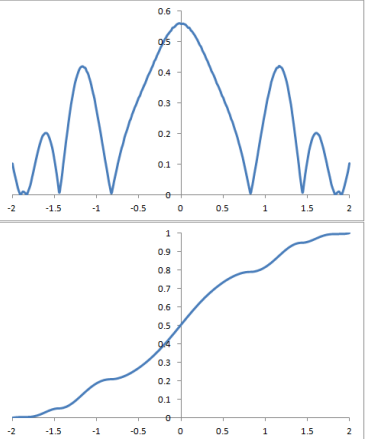
$$g(x_1) = \frac{|\sin(x_1^2 \times \pi) + \cos(x_1 \times \pi)|}{x_1^2 + 1}, -2 < x_1 < 2$$

$$\int_{-2}^2 g(x_1) dx_1 = \int_{-2}^2 \frac{|\sin(x_1^2 \times \pi) + \cos(x_1 \times \pi)|}{x_1^2 + 1} dx_1$$

$$= 1.7874482513218843$$

$$f(x_1) = \frac{|\sin(x_1^2 \times \pi) + \cos(x_1 \times \pi)|}{1.7874482513218843}, -2 < x_1 < 2$$

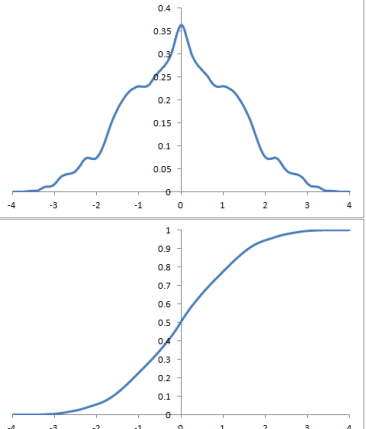
$$\int_{-2}^2 f(x_1) dx_1 = 1$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00020 Geometrical Mean: none Harmonic Mean : none Variance : 0.78275 S.D. : 0.88473 Skewed Coef. : -0.00011 Kurtosis Coef. : 2.30458 MAD : 0.71026 Range : 3.99945 Mid_range: -0.00000 Median : 0.00016 Q1: -0.56199 Q2: 0.00016 Q3: 0.56244 IQR : 1.12442 C.V. : none

1.5.1)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{|\sin(x^2 \times \pi) + \cos(x \times \pi)|}{1.7874482513218843}, -2 < x < 2$$

$$Y = X_1 + X_2$$

Pdf and df	Coefficient
	Mathematical Mean: -0.00008 Geometrical Mean: none Harmonic Mean : none Variance : 1.56455 S.D. : 1.25082 Skewed Coef. : -0.00006 Kurtosis Coef. : 2.65286 MAD : 1.00903 Range : 7.99698 Mid_range: -0.00014 Median : -0.00012 Q1: -0.89547 Q2: -0.00012 Q3: 0.89544 IQR : 1.79091 C.V. : none



1.5)

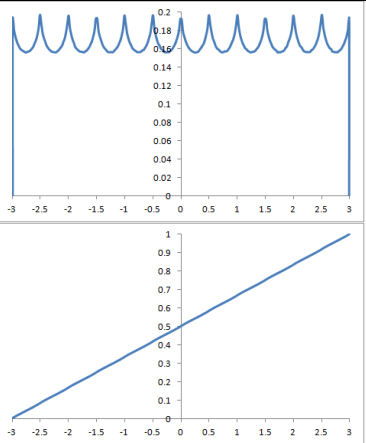
$$g(x_1) = \frac{1}{1 + \sqrt{|\cos(x_1 \times \pi)|} + \sqrt{|\sin(x_1 \times \pi)|}}, -3 < x_1 < 3$$

$$\int_{-1}^1 g(x_1) dx_1 = \frac{1}{1 + \sqrt{|\cos(x_1 \times \pi)|} + \sqrt{|\sin(x_1 \times \pi)|}} dx_1$$

$$= 2.3856976036065141$$

$$f(x_1) = \frac{1}{2.3856976036065141 \left(1 + \sqrt{|\cos(x_1 \times \pi)|} + \sqrt{|\sin(x_1 \times \pi)|}\right)}, -3 < x_1 < 3$$

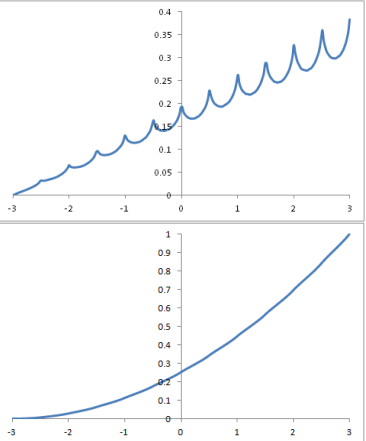
$$\int_{-1}^1 f(x_1) dx_1 = 1$$

Pdf and df	Coefficient
	Mathematical Mean: 0.00039 Geometrical Mean: none Harmonic Mean : none Variance : 3.00185 S.D. : 1.73259 Skewed Coef. : -0.00024 Kurtosis Coef. : 1.80087 MAD : 1.50017 Range : 6.00000 Mid_range: -0.00000 Median : 0.00045 Q1: -1.49987 Q2: 0.00045 Q3: 1.50045 IQR : 3.00032 C.V. : none

1.5.1)

$$X_1, X_2 \stackrel{i.i.d.}{\sim} f(x) = \frac{1}{2.3856976036065141 \left(1 + \sqrt{|\cos(x \times \pi)|} + \sqrt{|\sin(x \times \pi)|}\right)}, -3 < x < 3$$

$$Y = \text{Max}(X_1, X_2)$$

Pdf and df	Coefficient
	Mathematical Mean: 1.00015 Geometrical Mean: none Harmonic Mean : none Variance : 2.00119 S.D. : 1.41463 Skewed Coef. : -0.56493 Kurtosis Coef. : 2.39971 MAD : 1.18524 Range : 5.99956 Mid_range : 0.00022 Median : 1.24236 Q1 : -0.00013 Q2: 1.24236 Q3: 2.19283 IQR : 2.19296 C.V. : 1.41442

