

<<

>>

— «_» _____ 2001

2001

681.31:001.8

« . . . » . - : ,2001 . - . / .

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4-5

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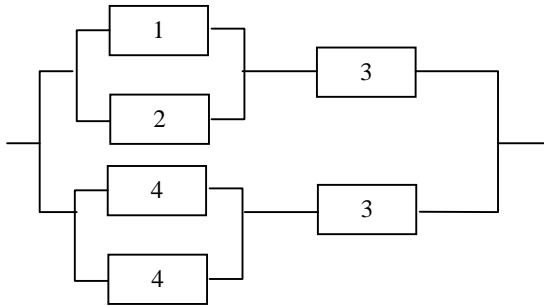
	1	2	3	4	5	6	7	8	9	0
0	1	2	3	4	5	6	7	8	9	25
1	11	12	13	14	15	16	17	18	19	10
2	21	22	23	24	25	1	2	3	4	20
3	6	7	8	9	10	11	12	13	14	5
4	16	17	18	19	20	21	22	23	24	15
5	1	2	3	4	5	6	7	8	9	25
6	11	12	13	14	15	16	17	18	19	10
7	21	22	23	24	25	1	2	3	4	20
8	6	7	8	9	10	11	12	13	14	5
9	16	17	18	19	20	21	22	23	24	15

1. 90 10 . ,

2 . , -

, 0.1. ,

3. : 1=0.1; 2=0.2; 3=0.9, 4=0.3



4. 0.15. 0.9. , 0.05 -

5. 0.2. -

6. 6% 70 ? -

7. 1000 600 ; 0.005.

8. X :

x_i	-4	0	2	3	5
P_i	0.1	0.2	0.1	p	0.3

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P (0 < X < 3)$.

9. :

$$f(x) = \begin{cases} 0, & x < 1, \\ Ax, & 1 \leq x < 2, \\ 0, & x \geq 2. \end{cases}$$

$$\left[0, \frac{\pi}{4} \right].$$

10. -

2.4.

0.2.

1) ,

0.3;

2) -

11. 15 -

():

50 48 52 53 54 61 52 60
 50 48 54 53 50 46 53 61

0.95

0.99.

12.

) ;
) Y,
) ;
) ;
)

X	41	50	81	104	120	139	154	180	208	241
Y	4	8	10	14	15	20	19	23	25	30

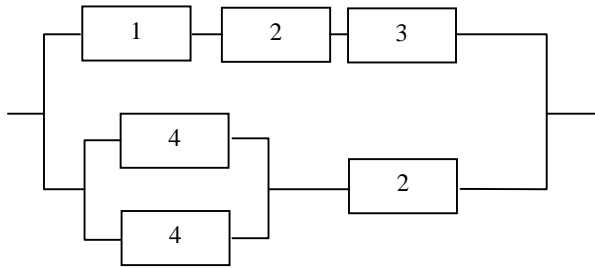
2.

1. 30 , 10 , 20

2. p - p , 0.1,

0.15, 0.2 0.25.

3. : 1= 2=0.9; 3=0.8, 4=0.1



4. 9 1000 , 40% , - 1 250.

5. , 0.1.

6. 0.51. 1200

7. 1.7 30

8.

X						
x_i	-1	1	2	3	5	
P_i	0.2	0.1	p	0.1	0.2	

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P(0 < X < 3)$.

9.

$$f(x) = \begin{cases} 0, & x < 1, \\ A(2x+1), & 1 \leq x < 2, \\ 0, & x \geq 2. \end{cases}$$

$$\left[0, \frac{\pi}{3}\right]$$

10.

100

1)

2)

11.

:

12 12

13

13

13

13

14

14

14

14

15 15

15

16

16

17

17

18

19

20

0.95

0.99.

12.

)

)

)

)

X	1	2	3	4	5	6	7	8	9
Y	16.50	13.75	13.31	12.50	12.75	12.35	11.83	10.50	9.83

3.

1.

2.

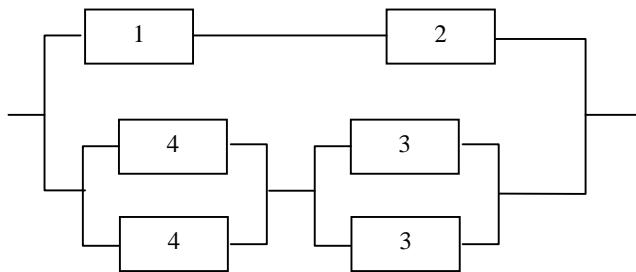
0.9,

0.8.

?

3.

: 1= 2=0.8; 3=0.1, 4=0.2



4.

0.3.

0.6.

0.8.

5.

0.7.

P

6.

0.4.

600

228

252

7.

15

8.

X				
x_i	2	3	4	5
P_i	0.1	p	0.4	0.3

- 1) p;
 2) $F(x)$;
 3) $D[X]$;
 4) $D[X]$ $\sigma[X]$
 5) $P(0 < X < 3)$.

9.

$$F(x) = \begin{cases} 0, & x < 0, \\ A + Bx^2, & 0 < x \leq 2, \\ 1, & x > 2. \end{cases}$$

10.

$[-1, 1]$.
 25 ...
 0.3 ...
 1) 24.5 ...
 2)

11.

(): 25
 11.0 10.0 9.5 10.0 10.3 11.0 12.0 10.0
 10.3 9.0 9.5 10.0 10.3 11.0 12.0 12.5
 9.5 10.0 10.3 11.0 12.5 10.5 10.3 11.0 12.0
 0.99.

12.

) ;
) Y,
) ;
) ;

X	0.1	1.3	0.6	1.0	1.2	1.8	2.1	2.7
Y	1.04	1.08	0.94	1.06	1.35	2.01	2.62	3.00

4.

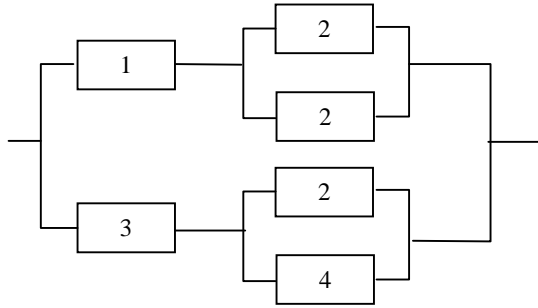
1.

2.

0.05; 0.06; 0.07 0.08.

3.

: 1=0.9; 2=0.1; 3=0.8, 4=0.2



4. -0.3 , 0.5 , 0.2 , 0.2% , 0.3% , 0.1% .

5. :

6. 120 , 0.2 .

7. « 0.95 » ? 500 .

20 .

8. X :

x_i	-3	-1	0	1	4
P_i	0.2	0.3	p	0.1	0.1

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P(-1 < X < 5)$.

9. :

$$F(x) = \begin{cases} 0, & x < -1, \\ Ax^3 + B, & -1 \leq x < 1, \\ 1, & x \geq 1. \end{cases}$$

$[1/2, 3]$.

10. 300 . / . 2672 . / .

- 1) 2700 . . ;
- 2)

11. (%) :

81	85	81	82	81	81	80	81	79	81
81	82	80	80	79	83	79	78	79	77

0.99

0.95 .

12. :

-) ;
-) Y,
-) ;
-) ;
-)

X	0	4	10	15	21	29	36	51	68	75
Y	66.7	71.0	76.3	80.6	85.7	92.9	99.4	113.6	125.1	134

5.

1. 50 , 10 , 3 .

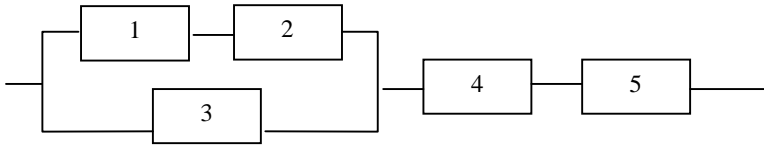
, 2

2.

0.9 0.95.

3.

: 1=0.2; 2=0.4; 3=0.1, 4=0.1, 5=0.2



4.

10%

, 40% -

0.01; 0.02; 0.04.

5.

6

0.9

6.

300

0.2

0.85

?

7.

0.002.

2000

8.

X

x_i	-1	0	2	3	4
P_i	0.3	0.1	p	0.1	0.2

1) p;

2) $F()$;

3) $[X]$;

4) $D[X]$ $\sigma[X]$

5) $P(0 < X < 5)$.

9.

$$f(x) = \begin{cases} 0, & x < 0, \\ C(x^2 + 2x), & 0 \leq x < 1, \\ 0, & x \geq 1. \end{cases}$$

[1/4, 1].

10.

5

1)

15 :

2)

11.

19

()

3.5	3.8	4.0	4.3	4.0	4.3	3.7	4.3				
4.5	3.8	4.0	3.8	4.0	4.3	3.7	4.3	3.7	4.0	4.3	

0.95

0.99.

12.

)

;

)

Y;

)

;

)

X	0	1	2	3	4	5	6	7	8	9
Y	30.0	29.1	28.4	28.1	28.0	27.7	27.5	27.2	27.0	26.8

6.

« -5 36».

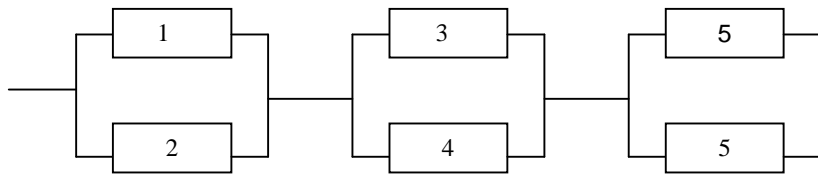
1.

2.

0.9; 0.95 0.85.

3.

: 1=0.3; 2=0.2; 3=0.4, 4=0.5, 5=0.3



4.

30%

1%

-2%

-3%.

, 25%-

5.

70%

6.

160

0.7

80

120

7.

8.

X

:

x_i	-5	1	2	3	4
P_i	0.4	0.2	p	0.1	0.1

1) p;

2)

$F()$

;

3)

$[X]$;

4)

$D[X]$

$\sigma[X]$

5) $P(-6 < X < 3)$.

9.

$$f(x) = \begin{cases} 0, & x < 0, \\ A(x^2 + 2x - 1), & 0 \leq x < 1, \\ 0, & x \geq 1. \end{cases}$$

[0.3, 2].

10.

1

2

1)

3 ;

2)

11.

(-)

1

8.12

8.17

8.20

8.21

8.20

8.17

8.22

8.27

8.22

8.17

8.32

8.20

8.21

8.16

0.99

0.95.

12.

)
)
)
)
)

X	0	2	3	4	5	6	8	10
Y	4.3	5.1	5.6	7.4	8.8	9.7	10.1	9.4

7.

1.

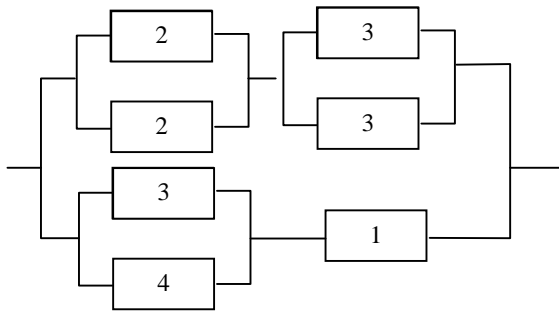
4.

2.

0.6; 0.7 0.75.

3.

: 1=0.9; 2=0.3; 3=0.2, 4=0.1



4.

30% 3% 35% 2% 35% 1%

5.

« »: 20

6.

120 10 ? 0.1.

15

7.

4 ; 9 ? 20 ?

8.

x_i	-2	-1	1	4	5
P_i	0.1	p	0.2	0.1	0.2

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P(-2 < X < 4)$.

9.

$$f(x) = \begin{cases} 0, & x > 0, \\ Ax+2, & 0 \leq x < 1, \\ 0, & x \geq 1. \end{cases}$$

[1/2, 2].

10.

43%.

6%.

42%;

1)

2)

11.

():

13.0 10.1 11.2 9.8 11.3 12.5 10.1 11.1 11.8

11.5 10.7 10.0 10.6 11.8 11.3 10.5 11.5 12.4

0.95

0.99.

12.

)

)

Y,

)

)

X	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2
Y	0.43	0.94	1.91	1.01	4.0	4.56	6.45	8.59

8.

1.

10

10

2

1

2.

-0.7.

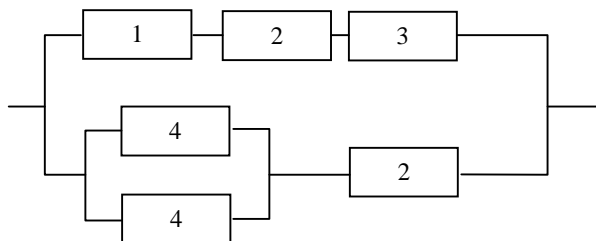
0.8,

: 1)

; 2)

3.

: 1=0.8; 2=0.9; 3=0.7, 4=0.2



4.

70%

90

100

100

- 80

5.

10

7.

6.

200

48%.

7.

200

().

0.015.

4

8.

X

x_i	-2	0	1	3	5
P_i	0.2	0.1	0.1	p	0.4

- 1) p;
 2) $F(\cdot)$;
 3) $[X]$;
 4) $D[X]$ $\sigma[X]$
 5) $P(-1 < X < 6)$.

9.

$$f(x) = \begin{cases} 0, & x < 1, \\ Ax - \frac{1}{2}, & 1 \leq x < 2, \\ 0, & x \geq 2. \end{cases}$$

[0,3].

10.

1.5 2.

1.75.

0.2.

- 1) ;
 2)

11.

():

3960	5000	4250	3680	4000	4360	4120
4720	4640	3920	5600	4880	4040	4800

0.95.

0.99

12.

-) ;
) Y,
) ;
) ;
)

X	1	2	3	4	5	6	7	8
Y	100	85.6	74.4	65.3	56.7	43.3	40.8	34.8

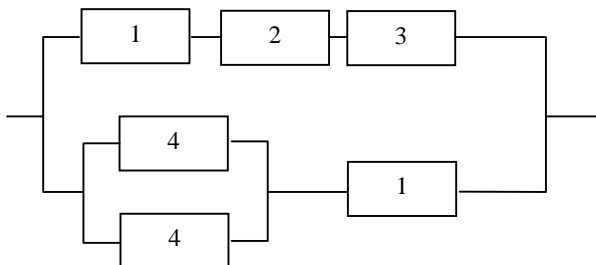
9

1.

2.

3.

: 1= 2=0.9; 3=0.8, 4=0.1



4. 60%, - 40%, 0.005, - 0.01.

5. 6, 0.8.

6. 6000, 0.5, 2800, 3200.

7. ?

8. X :

x_i	-3	-1	0	2	4
P_i	0.2	0.3	p	0.1	0.1

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P (-1 < X < 4)$.

9. $f(x) = \begin{cases} 0, & x < -2, \\ A(x+2), & -2 \leq x < 1, \\ 0, & x \geq 1. \end{cases}$

[0,2].

10. 4.9%, 0.3%, 5.2%;

- 1)
- 2)

11. ():

1800	1200	2400	1600	1800	1200	2400
3000	1800	1200	2400	1900	1200	1800
2400	3000	1200	2400	1800		

0.95, 0.99.

12.) ; Y,) ;) ;)

X	0.33	0.65	0.99	1.33	1.66	1.99	2.33	2.66
Y	11.86	15.67	20.60	26.69	33.71	43.93	51.13	61.49

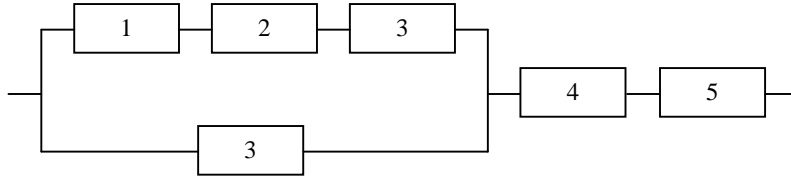
10.

1. 10, 2 -

?

2. 4
0.9; 0.8; 0.7 0.95.

3. : 1= 2=0.8; 3=0.7, 4=0.6, 5=0.8



4. 30% - 20% 50%
0.05; 0.1 0.15.

5. 8 ()
0.9.

6. 60% 200 110 130

7. 20 15 1

8. X :

x_i	-5	-3	1	2	3
P_i	0.2	0.3	0.1	p	0.1

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P (-3 < X < 4)$.

9. :

$$F(x) = \begin{cases} 0, & x \leq 0, \\ Ax, & 0 \leq x < 2, \\ B, & x \geq 2. \end{cases}$$

A , [1/2, 3/2].

10. 5 10

- 1) ; 15 :
- 2) .

11. 16 ():

2500	2640	3120	3500	3200	3010	2780	2850
2990	3620	3200	2400	3520	3120	3000	3010

0.99

0.95.

12.) ;

)
)
)

Y,

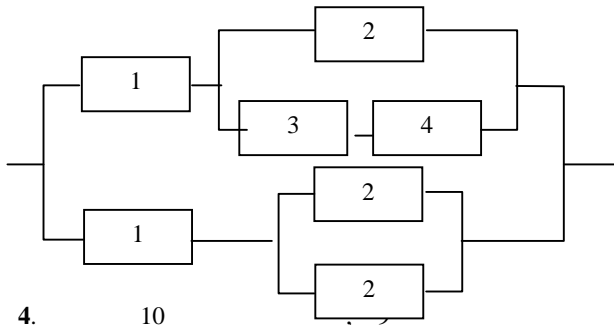
X	0.1	0.91	0.90	1.50	2.00	2.20	2.62	3.00	3.30	3.52
Y	0.15	0.20	0.43	0.35	0.52	0.61	0.68	1.15	1.22	1.37

11.

1. 15
 7 10, 5 - 8, 3 - 5

2. 0.8, -0.75.

3. : 1=0.9; 2=0.1; 3=0.5, 4=0.6



4. 10 2 2 -5

5. 5 ?

6. 0.6.

7. 20%,

1000
 160 240.

8. 5.

8.

X					
x_i	-1	0	2	4	6
P_i	0.1	0.2	p	0.2	0.1

- 1) p;
- 2) $F(x)$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$;
- 5) $P(0 < X < 7)$.

9.

$$f(x) = \begin{cases} 0, & x < 1, \\ A \left(x - \frac{1}{2} \right), & 1 \leq x < 2, \\ 0, & x \geq 2. \end{cases}$$

[-2, 1.5].

10.

150

1) , 100 :
 2) -

11.

4.3 4.4 4.2 4.3 4.4 4.5 4.3 4.5 4.4
 4.6 4.4 4.1 4.3 4.4 4.5 4.3 4.3 4.6 4.2

0.95

0.99.

12.

) ;
) Y;
) ;
)

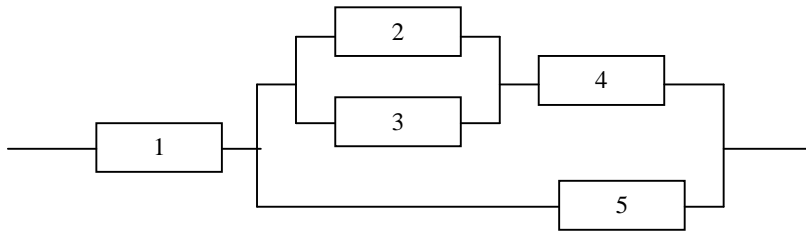
X	7.9	11.6	12.8	14.9	16.3	18.6	20.3	21.9	23.6	25.2
Y	13.0	22.8	24.8	28.6	31.6	38.7	40.0	44.9	43.0	44.3

12.

1. 30

2. 0.6; 0.7; 0.8.

3. : 1=0.8; 2=0.3; 3=0.5, 4=0.6, 5=0.7



4. 2% 55% 3% 45%

5. 8 0.3.

6. 150 0.4

7. 50 80 2000

0.005.

8.

x_i	-2	0	1	3	5
P_i	0.1	0.1	p	0.2	0.3

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P (-1 < X < 3)$.

9.

$$f(x) = \begin{cases} 0, & x < 0, \\ A(x+2), & 0 \leq x < 1, \\ 0, & x \geq 1. \end{cases}$$

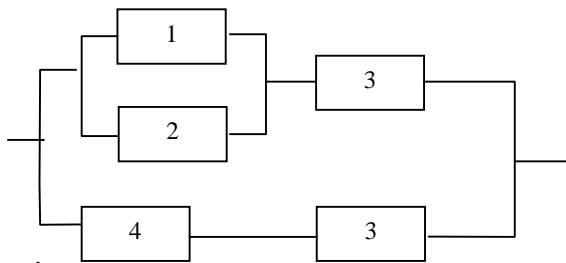
10. $[-1,1]$.
 1) 2- ;
 2)

11. (%):
 5.0 5.8 5.5 5.7 4.5 4.9 5.0 5.8 5.8
 4.2 4.5 4.8 4.9 5.0 5.3 5.5 5.3
 0.95
 0.99.

12.) ;
) Y,
) ;
) ;

X	26	30	34	36	42	46	50	54
Y	3.94	4.60	5.67	6.93	8.25	7.73	10.55	12.40

13.
 1. 18 , 4
 2. ?
 3. 0.1, -0.3 -0.5
 : 1=0.1; 2=0.2; 3=0.8, 4=0.7



4. 0.98 , 0.96.
 0.05 , ?
 5. 0.02. 2
 6. 0.25 , 800 1100
 4000
 7. 2.5 : 2

8.

	X					:
x_i	-3	-1	0	2	5	
P_i	0.2	0.1	0.1	p	0.4	

- 1) p;
 2) $F(\cdot)$;
 3) $[X]$;
 4) $D[X]$ $\sigma[X]$
 5) $P(-3 < X < 6)$.

9.

$$f(x) = \begin{cases} 0, & x < 1, \\ Ax+1, & 1 \leq x < 2, \\ 0, & x \geq 2. \end{cases}$$

10.

1) $[0, 1.5]$.
 2) 50
 3) 1.5

11.

1) 20
 2) 0.99
 3) 0.95

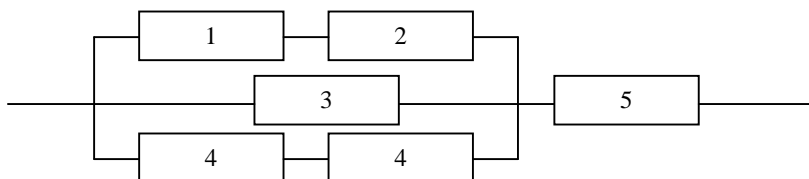
12.

- 1) ;
 2) Y;
 3) ;
 4)

X	-3	-2	-1	0	1	2	3	4
Y	4	8	10	14	16	20	23	26

14.

1.
 2. « »
 3. : 1=0.8; 2=0.7; 3=0.6, 4=0.9; 5=0,75



4.

2%, 1% 1%. 96%, 50, 0.5; 0.2; 0.18 0.02.

5.

0.7.

6.

0.2.

100

20

7.

5

30

8.

x_i	-6	2	1	2	5
P_i	0.3	0.1	p	0.1	0.2

1) p;

2) $F(x)$;

3) $D[X]$;

4) $\sigma[X]$;

5) $P(-2 < X < 2)$.

9.

$$F(x) = \begin{cases} 0, & x > 2, \\ Ax + B, & 2 \leq x < 4, \\ 1, & x \geq 4. \end{cases}$$

[2, 3].

10.

220

5

1)

220

10

2)

11.

17

():

992 969 992 878 1060 961 1002 960
1054 969 1018 902 1054 1098 1015 1012 1010

0.95

0.99.

12.

)

)

Y,

)

)

X	0.78	1.56	2.34	3.12	3.81	4.22	5.45	5.94
Y	0.1	1.20	1.12	2.25	4.26	4.83	12.8	16.35

15.

1.

1000

20

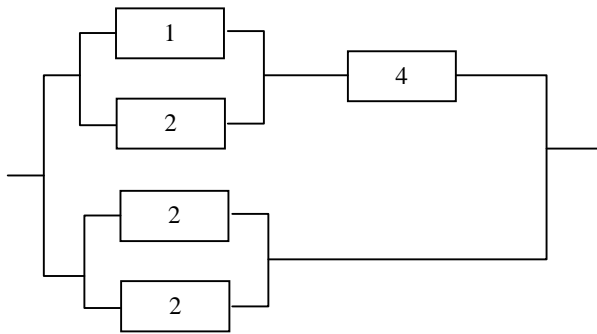
2.

18

12

3.

: 1=0.1; 2=0.2; 4=0.9



4. , -85% -80%. : 90%

5. 10 , -6 -4. [0, 10]

6. 100 0.4. 50.

7. 10

8. X :

x_i	-1	2	3	5	7
P_i	0.2	p	0.1	0.1	0.4

- 1) p;
 2) $F()$;
 3) $[X]$;
 4) $D[X]$ $\sigma[X]$
 5) $P(-1 < X < 5)$.

9. :

$$F(x) = \begin{cases} 0, & x < 2, \\ Ax^2 + Bx, & 2 \leq x < 4, \\ 1, & x \geq 4. \end{cases}$$

10. [0, 1] 1.5 . 0.5 . 1 ;

1) ,
 2) ,

11. 16 :

33.0	31.0	32.5	27.5	29.0	31.0	32.5	33.0
33.5	34.0	29.0	31.0	32.5	33.0	33.5	33.0

 0.99
 0.95.

12.) ;

)
)
)

Y,

X	12.0	13.1	14.0	16.1	17.4	18.0	20.0	21.4
Y	54	59	67	76	85	97	107	118

16.

1. 20, 3, 4

2.

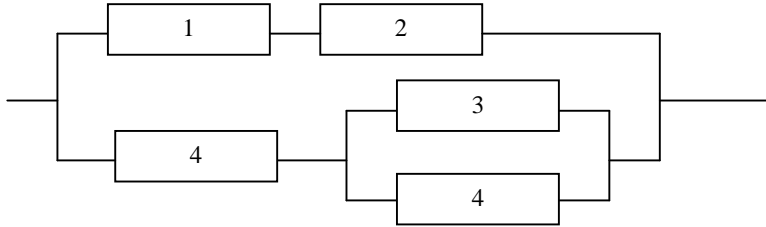
0.9.

p,

0.7.

3.

: 1=0.4; 2=0.5; P3=0.7; 4=0.9



4.

: 0.01; 0.15; 0.02.

50%

- 30%, - 20%.
 ?

5.

10%

6.

475

- 0.05.

30

7.

60

8.

X

x_i	-4	-2	0	1	3
P_i	0.1	0.3	0.4	0.1	p

1) p;

2)

$F(\cdot)$

;

3)

$[X]$;

4)

$D[X]$

$\sigma[X]$

5) $P(-4 < X < 1)$.

9.

$$F(x) = \begin{cases} 0, & x \leq 0, \\ A + Bx^3, & 0 \leq x < 2, \\ 1, & x \geq 2. \end{cases}$$

[1, 4].

10.

6

30

1)

6-

20 :

2)
6-
11.

(%):

49	50	52	48	49	51	48	49	49	50
50	53	48	49	51	47	49	50	51	52

0.95

0.99.

12.

) ;
) Y,
) ;
) ;
)

X	1.5	4.0	5.0	7.0	8.5	10.0	11.0	12.5	14.0	15.5
Y	5.0	4.5	7.0	7.5	9.5	9.0	11.3	9.2	11.6	12.3

17.

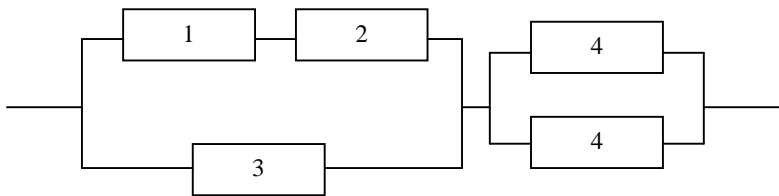
1. 20 - , 12

2. 3

0.8,

0.1.

3. : 1=0.7; 2=0.8; P3=0.5; 4=0.6



4. 30% , 25%-
1% , -1.5% - 2%.

5. « » « ».

6. 2000 , 0.6, - 0.4.
0.9

7. ? 100

8.

	X				
x_i	0	1	2	7	8
P_i	0.1	0.1	p	0.2	0.3

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P (1 < X < 8)$.

9.

$$F(x) = \begin{cases} 0, & x < 0, \\ A + B\sin(x), & 0 \leq x < \frac{\pi}{3}, \\ 1, & x \geq \frac{\pi}{3}. \end{cases}$$

$$\left[-1, \frac{\pi}{6}\right]$$

10.

0.5

1)

1.5 :

2)

11.

():

24.0	25.6	27.6	26.2	26.2	28.4	28.0	29.8	30.0	26.0	28.0	31.0
31.8	33.8	33.8	34.0	35.0	36.0	36.6	35.4				

0.99

0.95.

12.

)

)

Y,

)

)

X	2.7	4.6	6.3	7.8	9.2	10.6	12.0	13.4	14.7
Y	17.0	16.2	13.3	13.0	9.7	9.9	6.2	5.8	5.7

18.

1.

2.

0.8. 1-

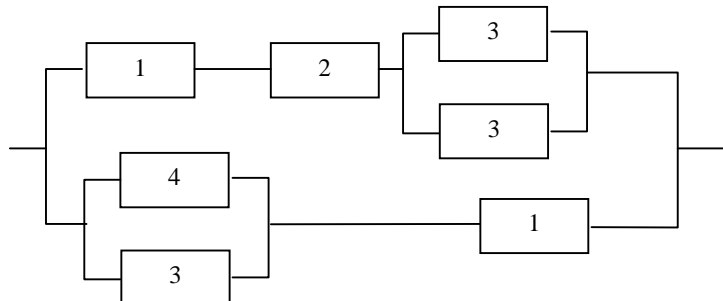
0.7.

2

2- -3

3.

: 1=0.7; 2=0.8; 3=0.1, 4=0.2



4.

0.01.

0.05.

0.95.

5.

-0.3.

?

6. 5000
0.2. : 80 ;
75 125

7. -2 ,
?

8. X :

x_i	-3	-1	0	4	5
P_i	0.2	0.3	0.1	p	0.1

- 1) p;
2) $F()$;
3) $[X]$;
4) $D[X]$ $\sigma[X]$
5) $P (-3 < X < 4)$.

9. :

$$F(x) = \begin{cases} 0, & x < 0, \\ A + B(x^3 + 3x), & 0 \leq x < 1, \\ 1, & x \geq 1. \end{cases}$$

[-1/2, 1/2].

10. 60 90 .
1) 75 ;
2)

11. 20 (3)

0.81	0.79	0.85	0.81	0.82	0.81	0.82	0.80	0.81	0.81	0.80
0.79	0.80	0.83	0.79	0.78	0.79	0.74	0.80	0.81		

0.95

0.99.

12. :

-) ;
) Y,
);
) ;
)

X	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
Y	3.3	3.7	4.0	4.3	4.5	4.9	5.1	5.5	5.8	6.2

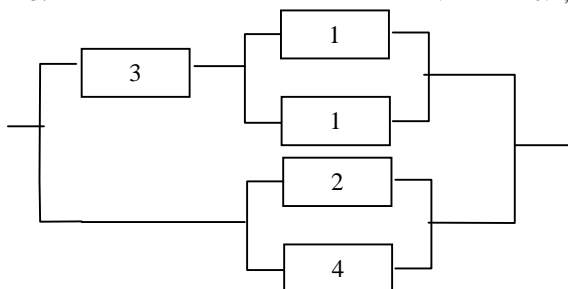
19.

1. 12 ,

2. 0.7,

0.8.

3. : 1= 2=0.1; 3=0.9, 4=0.2



4. 40%

- 0.7.

0.95,

5.

0.1.

6.

2000

0.4.

0.95.

7.

$1 - 2$

400

8.

$100 - 2$.

X

x_i	-2	0	1	3	5
P_i	0.3	0.1	p	0.1	0.2

1) p;

2)

$F()$

;

3)

$[X]$;

4)

$D[X]$

$\sigma[X]$

5) $P (-2 < X < 3)$.

9.

$$F(x) = \begin{cases} 0, & x < -1, \\ A + Bx^2, & -1 \leq x \leq 1, \\ 1, & x > 1. \end{cases}$$

10.

1%.

$[-1/2, 1/2]$.

75%.

1)

76%.

2)

75%.

11.

20

():

22960	32010	22980	33000	22950	33000	33040	33010	22980	33000	22960	33010
22980	33000	22950	22960	33010	22980	33000	33000				

0.95

0.99.

12.

)

)

)

)

X	1.2	1.8	2.3	3.1	4.1	4.6	5.2	6.7	8.3
Y	5.01	4.72	4.07	3.81	3.40	3.64	3.11	2.88	2.83

20.

1.

11

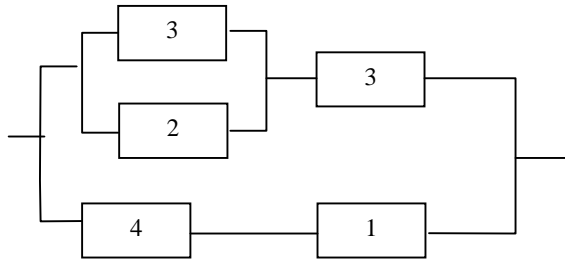
5

2.
-0.12

-0.01.

0.08,

3. : 1=0.6; 2=0.2; 3=0.8, 4=0.7



4. 600 200 , 250 -

0.91,

-0.95.

0.97,

5.

0.01.

6.

600

0.3

200

7.

40

8.

		X				
x_i		1	2	4	5	7
P_i		0.1	0.2	p	0.3	0.3

1) p;

2) $F()$;

3) $[X]$;

4) $D[X]$ $\sigma[X]$

5) $P(2 < X < 7)$.

9.

$$f(x) = \begin{cases} A \sin(3x), & x \in \left[0, \frac{\pi}{3}\right], \\ 0, & x \notin \left[0, \frac{\pi}{3}\right]. \end{cases}$$

$$\left[\frac{\pi}{6}, \frac{\pi}{2}\right].$$

10.

175 .

10 .

1)

175 ;

2)

11.

():

61 62 64 66 62 68 63 65 62 65
58 65 61 63 65 66 65 62 58 62

0.95

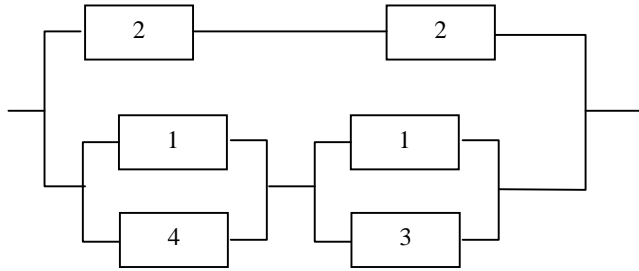
0.99.

12.

) ;
) Y, -
 ;
) ;
)

X	21	24	28	30	34	35	36	39	40
Y	1.8	1.3	1.4	1.3	1.2	1.1	1.0	1.1	0.8

1. 6 , 5 - , 4 - .
 ?
 2. , 0.2,
 -0.3, -0.4.
 3. : 1= 2=0.8; 3=0.1, 4=0.2



4. 1 45%
 0.01; 2 30%
 -0.015; 3 25%
 -0.02.
 2.
 5. 1000 , 0.6.
 6. 900
 0.9. 830
 7.
 8. X ;)

x_i	-3	-2	-1	0	4
P_i	0.2	0.1	p	0.3	0.1

- 1) p;
 2) $F()$;
 3) $[X]$;
 4) $D[X]$ $\sigma[X]$
 5) $P(-3 < X < 0)$.

9. :

$$f(x) = \begin{cases} 0, & x < -1, \\ A(3+x), & -1 \leq x \leq 0, \\ 0, & x > 0. \end{cases}$$

10. [-0.5, 0.5].
 0.8 . .
 0.2 . .
 1) 1 . .

2)

11.

20

(%):

1.8 2.3 1.5 1.8 2.5 1.8 2.3 2.6 1.5 1.8 2.5
 3.0 1.8 2.3 2.8 1.5 1.8 2.5 2.5 1.8

0.95

0.99.

12.

)
)
)
)
)

Y,

X	2.0	1.0	0.7	0.6	0.5	0.4	0.3	0.2	0.1
Y	5.1	9.8	16.3	14.3	16.9	26.4	22.9	27.5	30.2

22.

1. 10

2.

5

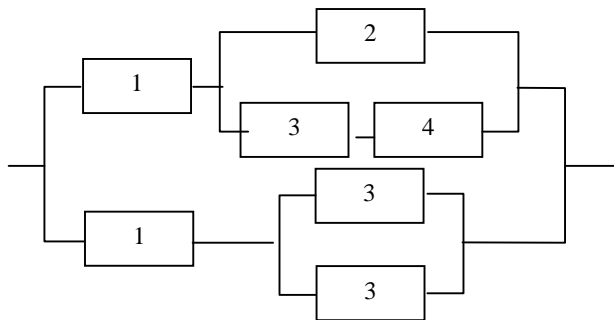
2.

0.2.

6

3.

: 1=0.9; 2=0.3; 3=0.5, 4=0.6



4.

0.1,

- 0.15.

5.

0.02

6.

0.8

100

70 86

7.

12

8.

X

x_i	-5	2	4	5	6
P_i	0.4	0.1	0.2	p	0.1

1) p;

2)

F()

- 3) $[X]$;
 4) $D[X]$ $\sigma[X]$
 5) $P(-5 < X < 4)$.

9.

$$f(x) = \begin{cases} A \cos(x), & x \in \left[0, \frac{\pi}{2}\right], \\ 0, & x \notin \left[0, \frac{\pi}{2}\right]. \end{cases}$$

$$\left[\frac{\pi}{3}, \pi\right].$$

10.

1)

2)

11.

99	125	103	92	100	109	118	106
116	98	140	122	101	120	131	

0.99

0.95.

12.

)

)

)

)

X	0.3	0.25	0.20	0.14	0.12	0.10	0.09	0.08	0.05
Y	5.0	4.5	7.0	6.5	9.5	9.0	11.3	9.2	11.8

23.

1. 36

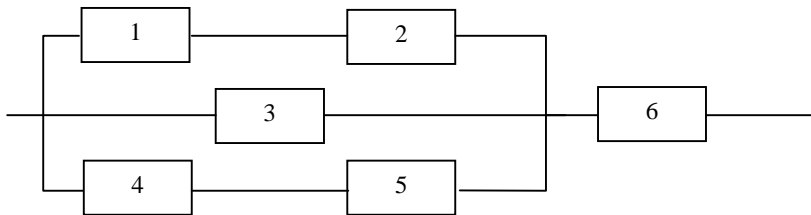
5.

5

2.

3.

: 1=0.1; 2=0.4; 3=0.5, 4=0.2; 5=0.3; 6=0.2



4.

- 40%

60%,

0.95,

- 0.9 (

5.

10

3

0.25.

6.

0.1, 1000, 240.

7.

30

8.

X

x_i	-3	-1	0	1	4
P_i	0.1	0.1	p	0.3	0.2

- 1) p;
- 2) $F(\cdot)$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P(-1 < X < 1)$.

9.

$$f(x) = \begin{cases} A \sin(x), & x \in \left[0, \frac{\pi}{2}\right], \\ 0, & \text{elsewhere} \end{cases}$$

$$\left[\frac{\pi}{4}, \frac{\pi}{2}\right]$$

10.

7% 13%

11%;

1)

2)

11.

1.0	2.2	2.6	3.0	4.0	1.3	2.3	2.8	3.0	4.3	1.5	2.5	3.0
5.0	3.0	1.5	2.5	3.0	3.4	4.0	2.0	2.5	3.0	3.8	6.0	

0.95

0.99.

12.

) ;
) Y,
) ;
) ;

X	3.0	1.5	1.0	0.7	0.6	0.5	0.4	0.3	0.2
Y	11.8	19.7	50.7	46.7	43.7	49.9	51.1	72.9	80.3

24.

1.

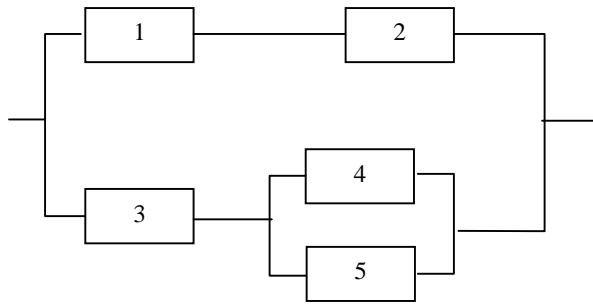
2.

0.6,

-0.9.

3.

: 1=0.2; 2=0.1; 3=0.2, 4=0.3, 5=0.4



4. $12 \ 10$, , , -

5. - ? -

6. , 0.4 , , -

7. 0.9 , 400 ? 0.005. ;) -

8. X :

x_i	-2	-1	1	2	3
P_i	0.2	0.3	0.1	p	0.1

- 1) p;
- 2) $F()$;
- 3) $[X]$;
- 4) $D[X]$ $\sigma[X]$
- 5) $P(-2 < X < 4)$.

9. :

$$f(x) = \begin{cases} Ax^2, & x \in [1, 3], \\ 0, & \text{elsewhere} \end{cases}$$

[0.5, 2].

10. 6%. 51%.

1) 45% 55%;

2) -

11. (/ ²):

298	290	298	263	318	288	301	288	316	291	306	271
316	328	305	304	303	291	255	295	296	293	308	316 286

0.95 0.99. , -

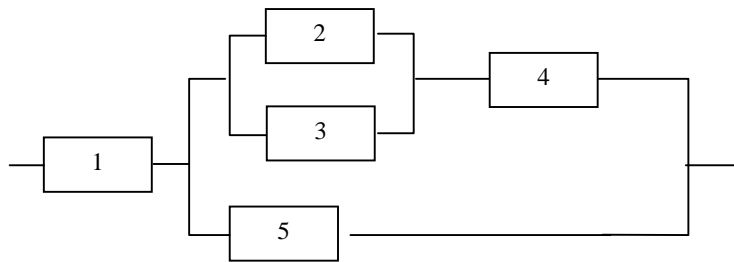
12.) ; Y, -

)
)

X	1	2	3	5	10	20	30	50	100
Y	4.15	3.52	4.08	3.25	2.91	2.62	2.41	2.30	1.21

25.

1. 30, 6, 3, 10 -
?
2. 1, 4, -2, 3, -3, 4 -
1
2 ?
3. : 1=0.1; 2=0.4; 3=0.3, 4=0.2, 5=0.5 -



4. 0.5; 0.6; 0.3; 0.7; 0.9. -
5. 70% -
6. 10% 400 350 -
?
7. 300 -
8. X :
:

x_i	-3	0	1	4	6
P_i	0.1	0.2	p	0.3	0.1

- 1) p;
2) $F()$;
3) $[X]$;
4) $D[X]$ $\sigma[X]$
5) $P (-3 < X < 4)$.

9. :

$$f(x) = \begin{cases} 0 & x \leq 0, \\ A(x^2 + x - 2) & 0 < x \leq 2, \\ 0 & x > 2. \end{cases}$$

[1, 5].

10. 0.4 / . 25 / .
1) 30 /
2)

11.

(/ ²):
3200 4000 3800 4100 3400 4200 3700
3900 3200 4100 3800 4200 3500 4000 3900

0.99. , 0.95 -

12.

) ;
) Y, -
) ;
) ;

X	5.7	4.3	3.8	3.1	2.7	2	1.7	1.1	0.7
Y	4.15	3.52	4.08	3.25	2.91	2.62	2.41	2.3	1.21

$$\Phi(x) = \frac{1}{\sqrt{2\pi}} \int_0^x e^{-x^2/2} dx$$

	()		()		()		()		()
0.00	0.000	0.40	0.1554	0.80	0.2881	1.20	0.3849	1.60	0.4452
0.01	0.004	0.41	0.1591	0.81	0.2910	1.21	0.3869	1.61	0.4463
0.02	0.0080	0.42	0.1628	0.82	0.2939	1.22	0.3888	1.62	0.4474
0.03	0.0120	0.43	0.1664	0.83	0.2967	1.23	0.3907	1.63	0.4484
0.04	0.0160	0.44	0.1700	0.84	0.2995	1.24	0.3925	1.64	0.4495
0.05	0.0199	0.45	0.1736	0.85	0.3023	1.25	0.3944	1.65	0.4505
0.06	0.0239	0.46	0.1772	0.86	0.3051	1.26	0.3962	1.66	0.4515
0.07	0.0279	0.47	0.1808	0.87	0.3078	1.27	0.3980	1.67	0.4525
0.08	0.0319	0.48	0.1844	0.88	0.3106	1.28	0.3997	1.68	0.4535
0.09	0.3569	0.49	0.1879	0.89	0.3133	1.29	0.4015	1.69	0.4545
0.10	0.0398	0.50	0.1915	0.90	0.3159	1.30	0.4032	1.70	0.4554
0.11	0.0438	0.51	0.1950	0.91	0.3186	1.31	0.4049	1.71	0.4564
0.12	0.0478	0.52	0.1985	0.92	0.3212	1.32	0.4066	1.72	0.4573
0.13	0.0517	0.53	0.2019	0.93	0.3238	1.33	0.4082	1.73	0.4582
0.14	0.0557	0.54	0.2054	0.94	0.3264	1.34	0.4099	1.74	0.4591
0.15	0.0596	0.55	0.2088	0.95	0.3289	1.35	0.4115	1.75	0.4599
0.16	0.0636	0.56	0.2123	0.96	0.3315	1.36	0.4131	1.76	0.4608
0.17	0.0675	0.57	0.2157	0.97	0.3340	1.37	0.4147	1.77	0.4616
0.18	0.0714	0.58	0.2190	0.98	0.3365	1.38	0.4162	1.78	0.4625
0.19	0.0754	0.59	0.2224	0.99	0.3389	1.39	0.4177	1.79	0.4633
0.20	0.0793	0.60	0.2257	1.00	0.3413	1.40	0.4192	1.80	0.4641
0.21	0.0832	0.61	0.2291	1.01	0.3438	1.41	0.4207	1.81	0.4649
0.22	0.0871	0.62	0.2324	1.02	0.3461	1.42	0.4222	1.82	0.4656
0.23	0.0910	0.63	0.2357	1.03	0.3485	1.43	0.4236	1.83	0.4664
0.24	0.0948	0.64	0.2389	1.04	0.3508	1.44	0.4251	1.84	0.4671
0.25	0.0987	0.65	0.2422	1.05	0.3531	1.45	0.4265	1.85	0.4678
0.26	0.1026	0.66	0.2454	1.06	0.3554	1.46	0.4279	1.86	0.4686
0.27	0.1064	0.67	0.2486	1.07	0.3577	1.47	0.4292	1.87	0.4693
0.28	0.1103	0.68	0.2517	1.08	0.3599	1.48	0.4306	1.88	0.4699
0.29	0.1141	0.69	0.2549	1.09	0.3621	1.49	0.4319	1.89	0.4706
0.30	0.1179	0.70	0.2580	1.10	0.3643	1.50	0.4332	1.90	0.4713
0.31	0.1217	0.71	0.2611	1.11	0.3665	1.51	0.4345	1.91	0.4719
0.32	0.1255	0.72	0.2642	1.12	0.3686	1.52	0.4357	1.92	0.4726
0.33	0.1293	0.73	0.2673	1.13	0.3708	1.53	0.4370	1.93	0.4732
0.34	0.1331	0.74	0.2704	1.14	0.3729	1.54	0.4382	1.94	0.4738
0.35	0.1368	0.75	0.2734	1.15	0.3749	1.55	0.4394	1.95	0.4744
0.36	0.1406	0.76	0.2764	1.16	0.3770	1.56	0.4406	1.96	0.4750
0.37	0.1443	0.77	0.2794	1.17	0.3790	1.57	0.4418	1.97	0.4756
0.38	0.1480	0.78	0.2823	1.18	0.3810	1.58	0.4429	1.98	0.4761
0.39	0.1517	0.79	0.2852	1.19	0.3830	1.59	0.4441	1.99	0.4767
2.00	0.4773	2.26	0.4881	2.52	0.4941	2.78	0.4973	3.20	0.4993
2.02	0.4783	2.28	0.4887	2.54	0.4945	2.80	0.4974	3.30	0.4995
2.04	0.4793	2.30	0.4893	2.56	0.4948	2.82	0.4976	3.40	0.49966
2.06	0.4803	2.32	0.4898	2.58	0.4951	2.84	0.4977	3.50	0.49978
2.08	0.4812	2.34	0.4904	2.60	0.4953	2.86	0.4979	3.60	0.499841
2.10	0.4821	2.36	0.4909	2.62	0.4956	2.88	0.4980	3.70	0.499903

2.12	0.4830	2.38	0.4913	2.64	0.4959	2.90	0.4981	3.80	0.499928
2.14	0.4838	2.40	0.4918	2.66	0.4961	2.92	0.4983	3.90	0.499943
2.16	0.4846	2.42	0.4922	2.68	0.4963	2.94	0.4984	4.00	0.499968
2.18	0.4854	2.44	0.4927	2.70	0.4965	2.96	0.4985	4.50	0.499997
2.20	0.4861	2.46	0.4931	2.72	0.4967	2.98	0.4986	5.00	0.499997
2.22	0.4868	2.48	0.4934	2.74	0.4969	3.00	0.4987		
2.24	0.4875	2.50	0.4938	2.76	0.4971	3.10	0.4990		

3

$$t = t(\gamma, n)$$

n	γ			n	γ		
	0.95	0.99	0.999		0.95	0.99	0.999
5	2.87	4.60	8.61	20	2.093	2.861	3.883
6	2.57	4.03	6.86	25	2.064	2.797	3.745
7	2.47	3.71	5.96	30	2.045	2.756	3.659
8	2.37	3.50	5.41	35	2.032	2.720	3.600
9	2.31	3.36	5.04	40	2.023	2.708	3.558
10	2.26	3.25	4.78	45	2.016	2.692	3.527
11	2.23	3.17	4.59	50	2.009	2.679	3.502
12	2.20	3.11	4.44	60	2.001	2.662	3.464
13	2.18	3.06	4.32	70	1.996	2.649	3.439
14	2.16	3.01	4.22	80	1.991	2.640	3.418
15	2.15	2.98	4.14	90	1.987	2.633	3.403
16	2.13	2.95	4.07	100	1.984	2.627	3.392
17	2.12	2.92	4.02	120	1.980	2.617	3.374
18	2.11	2.90	3.97	140	1.960	2.576	3.291
19	2.10	2.88	3.92				

4

$$q = q(\gamma, n)$$

n	γ			n	γ		
	0.95	0.99	0.999		0.95	0.99	0.999
5	1.37	2.67	5.64	20	0.37	0.58	0.88
6	1.09	2.01	3.88	25	0.32	0.49	0.73
7	0.92	1.62	2.98	30	0.28	0.43	0.63
8	0.80	1.38	2.42	35	0.26	0.38	0.56
9	0.71	1.20	2.06	40	0.24	0.35	0.50
10	0.65	1.08	1.80	45	0.22	0.32	0.46
11	0.59	0.98	1.60	50	0.21	0.30	0.43
12	0.55	0.90	1.45	60	0.188	0.269	0.38
13	0.52	0.83	1.33	70	0.174	0.245	0.34
14	0.48	0.78	1.23	80	0.161	0.226	0.31
15	0.46	0.73	1.15	90	0.151	0.211	0.29
16	0.44	0.70	1.07	100	0.143	0.198	0.27
17	0.42	0.66	1.01	150	0.115	0.160	0.211
18	0.40	0.63	0.96	200	0.099	0.136	0.185
19	0.39	0.60	0.92	250	0.089	0.120	0.162