Вариант - 1  
1. а) 1/132; б) 5/44.  
  
2. a) (C(9, 1) + C(9, 8)/C(16, 8)); б) C(7, 3)C(9, 5) + C(7, 4)C(9, 4) + C(7, 5)C(9, 3) + C(7, 6)C(9, 2) + C(7, 7)C(9, 1)/C(16, 8)  
  
3. A = (T1 ∧ T2 ∧ T3) ∧ (D1 ∧ D2 ∧ D3 ∧ D4) ∧ (R1 ∨ R2 ∨ R3 ∨ R4 ∨ R5)  
  
4. a) 0.84; б) 0.16; в) 0.24  
  
5. 0.4  
  
6. 0,128200  
  
7. 0.3667  
  
8. 0.6905  
  
9. 0.9969.  
  
10. a)0.082; b) 0.7123  
  
11. 0.2405.  
  
12. M(X) = 2.7731, D(X) = 2.4218, σ(X) = 1.5562.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 1 | 2 | 3 | 4 | 5 |
| 12 | P | 0.3 | 0.21 | 0.147 | 0.1029 | 0.2401 |

13. MX = 2.4; DX = 0.96

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | 2 | 3 | 4 |
| 13 | P | 0,02560 | 0,15360 | 0,34560 | 0,34560 | 0,12960 |

14. MX = 30

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | ... | n | ... |
| 14 | P | (30^0)/0! \* e^-30 | (30^1)/1! \* e^-30 | ... | (30^n)/n! \* e^-30 | ... |

15. а) M(X) = 3.3 + 5p; D(X) = 9.81 -8,000p - 25.0p^2; M(Y) = 0.6; D(Y) = 0.84;
в) M(Z1) = 7.2 + 10.0p; D(Z1) = 40.08 -32,000p - 100.0p^2; M(Z2) = 1.98 + 3.0p; D(Z2) = 20.9196 + 18,120p - 9.0p^2.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z1 | 7 | 9 | 11 | 13 | 19 | 21 |
| 15 | P | 0.15 | 0.05 | 0.3p | 0.1p | 0.06 | 0.02 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z2 | 3 | 9 | 5 | 15 | 9 | 27 |
| 15 | P | 0.15 | 0.05 | 0.3p | 0.1p | 0.06 | 0.02 |

16. 1) f(x) = 0, при x ⩽ 0; 1, при 0 < x ⩽ 1; 0, при x > 1}; 2) M(X) = 1/2, D(X) = 1/12, σ(Х) = sqrt(1/12); 3) Р(a < X < b) = 0.3.  
  
17. 1) 2/3; 2) F(x) = {0, при x < 1; (x^2 - 1)/3, при 1 ⩽ x ⩽ 2; 1, при x > 2}; 3) Ассиметрия: -0.01, эксцесс: 1.5.  
  
18. 1) Выполняется при нормализующем множителе = 1; 2) F(x) = {0, при x ⩽ -1; x/2, при -1 < x ⩽ 0; x/2 - x^2/8, при 0 < x ⩽ 2; 1, при x > 2}; 3) 0.8; 3) MX = 1/12, DX = 1/2, σ(Х) = 0,707  
  
19. 12.4 < X < 13.6.  
  
20. а) 0,000370; б) 0,0003404; в) 0,00028780.  
  
21. 0.3085

Вариант - 2  
1. a) 1/45; b) 1/302400.  
  
2. а) 2/3; б) 8/9.  
  
3. A = {1, 3, 5}; B = {1, 2, 4, 5, 6}; C = {1, 2, 3, 4, 6}
а) {1}; б) {1, 2, 3, 4, 5, 6}; в) {2, 4, 6}.  
  
4. а) 0.18; б) 0.42 в) 0.28.  
  
5. 0.174  
  
6. 0.8959.  
  
7. 0.3333  
  
8. 0.6286  
  
9. 0,00030000  
  
10. а) 0,000000001357347; б) 0,50400.  
  
11. 0.2391.  
  
12. MX = 2.5; DX = 1.25; σ(X) = 1.118

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| № | X | 1 | 2 | 3 | 4 |
| 12 | P | 0.25 | 0.25 | 0.25 | 0.25 |

13. MX = 4.0; DX = 0.8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | 2 | 3 | 4 | 5 |
| 13 | P | 0,00030 | 0,00640 | 0,05120 | 0,20480 | 0,40960 | 0,32770 |

14. MX = 30

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | ... | n | ... |
| 14 | P | (30^0)/0! \* e^-30 | (30^1)/1! \* e^-30 | ... | (30^n)/n! \* e^-30 | ... |

15. а) M(X) = 4.8 + 4p; D(X) = 18.36 -22,400p - 16.0p^2; M(Y) = 1.6; D(Y) = 1.44;
в) M(Z1) = 11.2 + 8.0p; D(Z1) = 74.88 -89,600p - 64.0p^2; M(Z2) = 7.68 + 6.4p; D(Z2) = 106.6176 -34,304p - 40.96p^2.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z1 | 7 | 9 | 9 | 11 | 19 | 21 |
| 15 | P | 0.04 | 0.04 | 0.4p | 0.4p | 0.2 | 0.2 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z2 | 3 | 9 | 4 | 12 | 9 | 27 |
| 15 | P | 0.04 | 0.04 | 0.4p | 0.4p | 0.2 | 0.2 |

16. 1) {0, при x ⩽ 0; 2 \* x / 9, при 0 < x ⩽ 3; 0, при x > 3}; 2) MX = 2.0, DX = 4.5, σ(Х) = 2.1213; 3) 0.0222  
  
17. 1) 2/3; 2) F(x) = {0, при x < 1; (x^2 - 1)/3, при 1 ⩽ x ⩽ 2; 1, при x > 2}; 3) Ассиметрия: -0.01, эксцесс: 1.5.  
  
18. 1) выполняется при нормализующем множителе = 1; 2) F(x) = {0, при x ⩽ -2; ((x+2)^2)/8, при -2 < x ⩽ 0; 1 - ((x-2)^2)/8, при 0 < x ⩽ 2; 1, при x > 2}; 3) P = 0.6; 4) M(X) = 0, D(X) = 0.67; σ(Х) = 0.82.  
  
19. 9.36 < X < 10.64  
  
20. а) 0,000370; б) 0,0003264; в) 0,00027596.  
  
21. 0.0214.

Вариант - 3  
1. a) 1/45; b) 1/75600.  
  
2. а) 2/3; б) 8/9.  
  
3. A = {1, 3, 5}; B = {1, 2, 4, 5, 6}; C = {1, 2, 3, 4, 6}
а) {1}; б) {1, 2, 3, 4, 5, 6}; в) {2, 4, 6}.  
  
4. а) 0.05; б) 0.45 в) 0.45.  
  
5. 0.304  
  
6. 0,032300  
  
7. 0.3471.  
  
8. 0.3652.  
  
9. 0.9969.  
  
10. а) 0,000856475877535; б) 0,99680.  
  
11. 0.2272.  
  
12. M(X) = 3.3616, D(X) = 2.57, σ(X) = 1.6031.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 1 | 2 | 3 | 4 | 5 |
| 12 | P | 0.2 | 0.16 | 0.128 | 0.1024 | 0.4096 |

13. MX = 2.8; DX = 0.84

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | 2 | 3 | 4 |
| 13 | P | 0,00810 | 0,07560 | 0,26460 | 0,41160 | 0,24010 |

14. MX = 30

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | ... | n | ... |
| 14 | P | (30^0)/0! \* e^-30 | (30^1)/1! \* e^-30 | ... | (30^n)/n! \* e^-30 | ... |

15. а) M(X) = 3.0 + 6p; D(X) = 11.4 + 0,000p - 36.0p^2; M(Y) = 0.5; D(Y) = 0.85;
в) M(Z1) = 6.5 + 12.0p; D(Z1) = 46.45 + 0,000p - 144.0p^2; M(Z2) = 1.5 + 3.0p; D(Z2) = 20.19 + 30,600p - 9.0p^2.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z1 | 5 | 7 | 13 | 15 | 17 | 19 |
| 15 | P | 0.06 | 0.03 | 0.2p | 0.1p | 0.06 | 0.03 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z2 | 2 | 6 | 6 | 18 | 8 | 24 |
| 15 | P | 0.06 | 0.03 | 0.2p | 0.1p | 0.06 | 0.03 |

16. 1) {0, при x ⩽ 0; 2 \* x / 9, при 0 < x ⩽ 3; 0, при x > 3}; 2) MX = 2.0, DX = 4.5, σ(Х) = 2.1213; 3) 0.2  
  
17. 1) 1/π; 2) F(x) = a \* arctg(x) + aπ/2; 3) Ассиметрия = 0, Эксцесс = 8/(aπ) - 3  
  
18. 1) выполняется при нормализующем множителе = 1; 2) F(x) = {0, при x ⩽ -2; ((x+2)^2)/8, при -2 < x ⩽ 0; 1 - ((x-2)^2)/8, при 0 < x ⩽ 2; 1, при x > 2}; 3) P = 0.5; 4) M(X) = 0, D(X) = 0.67; σ(Х) = 0.82.  
  
19. 4.7 < X < 5.3.  
  
20. а) 0,000386; б) 0,0003404; в) 0,00027596.  
  
21. 0.1526.

Вариант - 4  
1. а) 1/132; б) 5/66.  
  
2. a) (C(12, 4) + C(12, 8)/C(16, 8)); б) C(4, 2)C(12, 6) + C(4, 3)C(12, 5) + C(4, 4)C(12, 4)/C(16, 8)  
  
3. A = {1, 3, 5}; B = {1, 2, 4, 5, 6}; C = {1, 2, 3, 4, 6}
а) {1}; б) {1, 2, 3, 4, 5, 6}; в) {2, 4, 6}.  
  
4. а) 0.1; б) 0.4 в) 0.4.  
  
5. 0.4234.  
  
6. 0,059300  
  
7. 0.3333  
  
8. 0.6818  
  
9. 0,00000000  
  
10. а) 0,038932780054601; б) 0,00170.  
  
11. 0.1709.  
  
12. MX = 2.5; DX = 1.25; σ(X) = 1.118

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| № | X | 1 | 2 | 3 | 4 |
| 12 | P | 0.25 | 0.25 | 0.25 | 0.25 |

13. M(X) = 0.9; D(X) = 0.63.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | 2 | 3 |
| 13 | P | 0,34300 | 0,44100 | 0,18900 | 0,02700 |

14. M(X) = 2.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | ... | n | ... |
| 14 | P | (2^0)/0! \* e^-2 | (2^1)/1! \* e^-2 | ... | (2^n)/n! \* e^-2 | ... |

15. а) M(X) = 4.8 + 4p; D(X) = 11.76 -22,400p - 16.0p^2; M(Y) = 1.6; D(Y) = 2.24;
в) M(Z1) = 11.2 + 8.0p; D(Z1) = 49.28 -89,600p - 64.0p^2; M(Z2) = 7.68 + 6.4p; D(Z2) = 108.0576 -21,504p - 40.96p^2.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z1 | 6 | 8 | 10 | 12 | 20 | 22 |
| 15 | P | 0.24 | 0.12 | 0.4p | 0.2p | 0.16 | 0.08 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z2 | 4 | 8 | 8 | 16 | 18 | 36 |
| 15 | P | 0.24 | 0.12 | 0.4p | 0.2p | 0.16 | 0.08 |

16. 1) {0, при x ⩽ 0; 2 \* x / 9, при 0 < x ⩽ 3; 0, при x > 3}; 2) MX = 2.0, DX = 4.5, σ(Х) = 2.1213; 3) 0.1111  
  
17. 1) 1/π; 2) F(x) = a \* arctg(x) + aπ/2; 3) Ассиметрия = 0, Эксцесс = 8/(aπ) - 3  
  
18. 1) Выполняется при нормализующем множителе = 1; 2) F(x) = {0, при x ⩽ -1; x/2, при -1 < x ⩽ 0; x/2 - x^2/8, при 0 < x ⩽ 2; 1, при x > 2}; 3) 0.575; 3) MX = 1/12, DX = 1/2, σ(Х) = 0,707  
  
19. 3.1 < X < 4.9.  
  
20. a) A = ± 0.5774; б) A = 0.5774  
  
21. 0.3195.

Вариант - 5  
1. а) 1/132; б) 5/44.  
  
2. а) 2/3; б) 8/9.  
  
3. A = (T1 ∧ T2 ∧ T3) ∧ (D1 ∧ D2 ∧ D3 ∧ D4) ∧ (R1 ∨ R2 ∨ R3 ∨ R4 ∨ R5)  
  
4. а) 0.15; б) 0.35 в) 0.35.  
  
5. 0.5797.  
  
6. 0.947.  
  
7. 0.3  
  
8. 0.3962.  
  
9. 0.9987.  
  
10. а) 0,000000000000020; б) 0,50400.  
  
11. 0.2393.  
  
12. M(X) = 3.3616, D(X) = 2.57, σ(X) = 1.6031.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 1 | 2 | 3 | 4 | 5 |
| 12 | P | 0.2 | 0.16 | 0.128 | 0.1024 | 0.4096 |

13. M(X) = 1.6; D(X) = 0.96.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | 2 | 3 | 4 |
| 13 | P | 0,12960 | 0,34560 | 0,34560 | 0,15360 | 0,02560 |

14. MX = 30

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | X | 0 | 1 | ... | n | ... |
| 14 | P | (30^0)/0! \* e^-30 | (30^1)/1! \* e^-30 | ... | (30^n)/n! \* e^-30 | ... |

15. а) M(X) = 2.0 + 4p; D(X) = 12.4 + 0,000p - 16.0p^2; M(Y) = 0.7; D(Y) = 0.81;
в) M(Z1) = 4.7 + 8.0p; D(Z1) = 50.41 + 0,000p - 64.0p^2; M(Z2) = 1.4 + 2.8p; D(Z2) = 19.36 + 12,960p - 7.84p^2.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z1 | 3 | 5 | 9 | 11 | 19 | 21 |
| 15 | P | 0.08 | 0.02 | 0.4p | 0.1p | 0.08 | 0.02 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| № | Z2 | 1 | 3 | 4 | 12 | 9 | 27 |
| 15 | P | 0.08 | 0.02 | 0.4p | 0.1p | 0.08 | 0.02 |

16. 1) f(x) = 0, при x ⩽ 0; 1, при 0 < x ⩽ 1; 0, при x > 1}; 2) M(X) = 1/2, D(X) = 1/12, σ(Х) = sqrt(1/12); 3) Р(a < X < b) = 0.6.  
  
17. 1) 2/3; 2) F(x) = {0, при x < 1; (x^2 - 1)/3, при 1 ⩽ x ⩽ 2; 1, при x > 2}; 3) Ассиметрия: -0.01, эксцесс: 1.5.  
  
18. 1) Выполняется при нормализующем множителе = 1; 2) F(x) = {0, при x ⩽ -1; x/2, при -1 < x ⩽ 0; x/2 - x^2/8, при 0 < x ⩽ 2; 1, при x > 2}; 3) 0.525; 3) MX = 1/12, DX = 1/2, σ(Х) = 0,707  
  
19. 9.18 < X < 10.82  
  
20. a) A = ± 0.5774; б) A = 0.5774  
  
21. 0.0225.