**Таблица 1** значений функции

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0.00.10.20.30.40.50.60.70.80.91.01.11.21.31.41.51.61.71.81.92.02.12.22.32.42.52.62.72.82.93.03.13.23.33.43.53.63.73.83.9 | 0.39890.39700.39100.38140.36830.35210.33320.31230.28970.26610.24200.21790.1942**0.1714**0.14970.12950.11090.09400.07900.06560.05400.04400.03550.02830.02240.01750.01360.01040.00790.00600.00440.00330.00240.00170.00120.00090.00060.00040.00030.0002 | 0.39890.39650.39020.38020.36680.35030.33120.31010.28740.26370.23960.21550.1919**0.1691**0.14760.12760.10920.09250.07750.06440.05290.04310.03470.02770.02190.01710.01320.01010.00770.00580.00430.00320.00230.00170.00120.00080.00060.00040.00030.0002 | 0.39890.39610.38940.37900.36520.34850.32920.30790.28500.26130.23710.21310.1895**0.1669**0.14560.12570.10740.09090.07610.06320.05190.04220.03390.02700.02130.01670.01290.00990.00750.00560.00420.00310.00220.00160.00120.00080.00060.00040.00030.0002 | 0.39880.39560.38850.37780.36370.34670.32710.30560.28270.25890.23470.21070.1872**0.1647**0.14350.12380.10570.08930.07480.06200.05080.04130.03320.02640.02030.01630.01260.00960.00730.00550.00400.00300.00220.00160.00110.00080.00050.00040.00030.0002 | 0.39860.39510.38760.37650.36210.34480.32510.30340.28030.25650.23230.20830.1849**0.1626**0.14150.12190.10400.08780.07340.06080.04980.04040.03250.02580.02030.01580.01220.00930.00710.00530.00390.00290.00210.00150.00110.00080.00050.00040.00030.0002 | 0.39840.39450.38670.37520.36050.34290.32300.30110.27560.25410.22990.20590.1826**0.1604**0.13940.12000.10230.08630.07210.05960.04880.03960.03170.02520.01980.01540.01190.00910.00690.00510.00380.00280.00200.00150.00100.00070.00050.00040.00020.0002 | 0.39820.39390.38570.37390.35890.34100.32090.29890.27560.25160.22750.20360.1804**0.1582**0.13740.11820.10060.08480.07070.05840.04780.03870.03100.02460.01940.01510.01160.00880.00670.00500.00370.00270.00200.00140.00100.00070.00050.00030.00020.0002 | 0.39800.39320.38470.37260.35720.3391031870.29660.27320.24920.22510.20120.17810**.1561**0.13540.11630.09890.08330.06940.05730.04680.03790.03030.02410.01890.01470.01130.00860.00650.00480.00360.00260.00190.00140.00100.00070.00050.00030.00020.0002 | 0.39770.39250.38360.37120.35550.33720.31660.29430.27090.24680.22270.19890.17580.15390.13340.11450.09730.08180.06810.05620.04590.03710.02970.02350.01840.01430.01100.00840.00630.00470.00350.00250.00180.00130.00090.00070.00050.00030.00020.0001 | 0.39730.39180.38250.36970.35380.33520.31440.29200.26850.24440.22030.19650.17360.15180.13150.11270.09570.08040.06690.05510.04490.03630.02900.02290.01800.01390.01070.00810.00610.00460.00340.00250.00180.00130.00090.00060.00040.00030.00020.0001 |

 – функция четная. При .

**Таблица 2** значений функции

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | Ф(х) | x | Ф(х) | x | Ф(х) | x | Ф(х) |
| 0,000,010,020,030,040,050,060,070,080,090,100,110,120,130,140,150,160,170,180,190,200,210,220,230,240,250,260,270,280,290,300,310,320,330,340,350,360,370,380,390,400,410,420,430,440,450,460,470,480,49х | 0,00000,00400,00800,01200,01600,01990,02390,02790,03190,03590,03980,04380,04780,05170,05570,05960,06360,06750,07140,07530,07930,08320,08710,09100,09480,09870,10260,10640,11030,11410,11790,12170,12550,12930,13310,13680,14060,14430,14800,15170,15540,15910,16280,16640,17000,17360,17720,18080,18440,1879Ф(х) | 0,500,510,520,530,540,550,560,570,580,590,600,610,620,630,640,650,660,670,680,690,700,710,720,730,740,750,760,770,780,790,800,810,820,830,840,850,860,870,880,890,900,910,920,930,940,950,960,970,980,99х | 0,19150,1950019850,20190,20540,20880,21230,21570,21900,22240,22570,22910,23240,23570,23890,24220,24540,24860,25170,25490,25800,26110,26420,26730,27030,27340,27640,27940,28230,28520,28810,29100,29390,29670,29950,30230,30510,30780,31060,31330,31590,31860,32120,32380,32640,32890,33150,33400,33650,3389Ф(х) | 1,001,011,021,031,041,051,061,071,081,091,101,111,121,131,141,151,161,171,181,191,201,211,221,231,241,251,261,271,281,291,301,311,321,331,341,351,361,371,381,391,401,411,421,431,441,451,461,471,481,49х | 0,34130,34380,34610,34850,35080,35310,35540,35770,35990,36210,36430,36650,36860,37080,37290,37490,37700,37900,38100,38300,38490,38690,38830,39070,39250,39440,39620,39800,39970,40150,40320,40490,40660,40820,40990,41150,41310,41470,41620,41770,41920,42070,42220,42360,42510,42650,42790,42920,43060,4319Ф(х) | 1,501,511,521,531,541,551,561,571,581,591,601,611,621,631,641,651,661,671,681,691,701,711,721,731,741,751,761,771,781,791,801,811,821,831,841,851,861,871,881,891,901,911,921,931,941,951,961,971,981,99х | 0,43320,43450,43570,43700,43820,43940,44060,44180,44290,44410,44520,44630,44740,44840,44950,45050,45150,45250,45350,45450,45540,45640,45730,45820,45910,45990,46080,46160,46250,46330,46410,46490,46560,46640,46710,46780,46860,46930,46990,47060,47130,47190,47260,47320,47380,47440,47500,47560,47610,4767Ф(х) |
| 2,002,022,042,062,082,102,122,142,162,182,202,222,242,262,28 | 0,47720,47830,47930,48030,48120,48210,48300,48380,48460,48540,48610,48680,48750,48810,4887 | 2,302,322,342,362,382,402,422,442,462,482,502,522,542,562,58 | 0,48930,48980,49040,49090,49130,49180,49220,49270,49310,49340,49380,49410,49450,49480,4951 | 2,602,622,642,662,682,702,722,742,762,782,802,822,842,862,88 | 0,49530,49560,49590,49610,49630,49650,49670,49690,49710,49730,49740,49760,49770,49790,4980 | 2,902,922,942,962,983,003,203,403,603,804,004,505,00 | 0,4981049820,49840,49850,49860,498650,499310,499660,4998410,4999280,4999680,4999970,499997 |

Ф(-х) = - Ф(х) – функция нечетная.

При х > 5 функция Ф(х) = 0,5.

Приложение 5 Критические точки распределения  **χ** 2

|  |  |
| --- | --- |
| Число степеней свободы k  | Уровень значимости  |
| 0.01 | 0.025 | 0.05 | 0.95 | 0.975 | 0.99 |
| 1 | 6.6 | 5.0 | 3.8 | 0.0039 | 0.00098 | 0.00016 |
| 2 | 9.2 | 7.4 | 6.0 | 0.103 | 0.051 | 0.020 |
| 3 | 11.3 | 9.4 | 7.8 | 0.352 | 0.216 | 0.115 |
| 4 | 13.3 | 11.1 | 9.5 | 0.711 | 0.484 | 0.297 |
| 5 | 15.1 | 12.8 | 11.1 | 1.15 | 0.831 | 0.554 |
| 6 | 16.8 | 14.4 | 12.6 | 1.64 | 1.24 | 0.872 |
| 7 | 18.5 | 16.0 | 14.1 | 2.17 | 1.69 | 1.24 |
| 8 | 20.1 | 17.5 | 15.5 | 2.73 | 2.18 | 1.65 |
| 9 | 21.7 | 19.0 | 16.9 | 3.33 | 2.70 | 2.09 |
| 10 | 23.2 | 20.5 | 18.3 | 3.94 | 3.25 | 2.56 |
| 11 | 24.7 | 21.9 | 19.7 | 4.57 | 3.82 | 3.05 |
| 12 | 26.2 | 23.3 | 21.0 | 5.23 | 4.40 | 3.57 |
| 13 | 27.7 | 24.7 | 22.4 | 5.89 | 5.01 | 4.11 |
| 14 | 29.1 | 26.1 | 23.7 | 6.57 | 5.63 | 4.66 |
| 15 | 30.6 | 27.5 | 25.0 | 7.26 | 6.26 | 5.23 |
| 16 | 32.0 | 28.8 | 26.3 | 7.96 | 6.91 | 5.81 |
| 17 | 33.4 | 30.2 | 27.6 | 8.67 | 7.56 | 6.41 |
| 18 | 34.8 | 31.5 | 28.9 | 9.39 | 8.23 | 7.01 |
| 19 | 36.2 | 32.9 | 30.1 | 10.1 | 8.91 | 7.63 |
| 20 | 37.6 | 34.2 | 31.4 | 10.9 | 9.59 | 8.26 |
| 21 | 38.9 | 35.5 | 32.7 | 11.6 | 10.3 | 8.90 |
| 22 | 40.3 | 36.8 | 33.9 | 12.3 | 11.0 | 9.54 |
| 23 | 41.6 | 38.1 | 35.2 | 13.1 | 11.7 | 10.2 |
| 24 | 43.0 | 39.4 | 36.4 | 13.8 | 12.4 | 10.9 |
| 25 | 44.3 | 40.6 | 37.7 | 14.6 | 13.1 | 11.5 |
| 26 | 45.6 | 41.9 | 38.9 | 15.4 | 13.8 | 12.2 |
| 27 | 47.0 | 43.2 | 40.1 | 16.2 | 14.6 | 12.9 |
| 28 | 48.3 | 44.5 | 41.3 | 16.9 | 15.3 | 13.6 |
| 29 | 49.6 | 45.7 | 42.6 | 17.7 | 16.0 | 14.3 |
| 30 | 50.9 | 47.0 | 43.8 | 18.5 | 16.8 | 15.0 |

**Приложение 7** Критические точки распределения F Фишера- Снедекора

(k1 –число степеней свободы большей дисперсии, k2-число степеней свободы меньшей дисперсии)

|  |
| --- |
| Уровень значимости  |
| K2 | K1 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 4052 | 4999 | 5403 | 5625 | 5764 | 5889 | 5928 | 5981 | 6022 | 6056 | 6082 | 6106 |
| 2 | 98,49 | 99,01 | 99,17 | 99,25 | 99,30 | 99,33 | 99,34 | 99,36 | 99,38 | 99,40 | 99,41 | 99,42 |
| 3 | 34,12 | 30,81 | 29,46 | 28,71 | 28,24 | 27,91 | 27,67 | 27,49 | 27,34 | 27,23 | 27,13 | 27,05 |
| 4 | 21,20 | 18,00 | 16,69 | 15,98 | 15,52 | 15,21 | 14,98 | 14,80 | 14,66 | 14,54 | 14,45 | 14,37 |
| 5 | 16,26 | 13,27 | 12,06 | 11,39 | 10,97 | 10,67 | 10,45 | 10,27 | 10,15 | 10,05 | 9,96 | 9,89 |
| 6 | 13,74 | 10,92 | 9,78 | 9,15 | 8,75 | 8,47 | 8,26 | 8,10 | 7,98 | 7,87 | 7,79 | 7,72 |
| 7 | 12,25 | 9,55 | 8,45 | 7,85 | 7,46 | 7,19 | 7,00 | 6,84 | 6,71 | 6,62 | 6,54 | 6,47 |
| 8 | 11,26 | 8,65 | 7,59 | 7,01 | 6,63 | 6,37 | 6,19 | 6,03 | 5,91 | 5,82 | 5,74 | 5,67 |
| 9 | 10,56 | 8,02 | 6,99 | 6,42 | 6,06 | 5,80 | 5,62 | 5,47 | 5,35 | 5,26 | 5,18 | 5,11 |
| 10 | 10,04 | 7,56 | 6,55 | 5,99 | 5,64 | 5,39 | 5,21 | 5,06 | 4,95 | 4,85 | 4,78 | 4,71 |
| 11 | 9,86 | 7,20 | 6,22 | 5,67 | 5,32 | 5,07 | 4,88 | 4,74 | 4,63 | 4,54 | 4,46 | 4,40 |
| 12 | 9,33 | 6,93 | 5,95 | 5,41 | 5,06 | 4,82 | 4,65 | 4,50 | 4,39 | 4,30 | 4,22 | 4,16 |
| 13 | 9,07 | 6,70 | 5,74 | 5,20 | 4,86 | 4,62 | 4,44 | 4,30 | 4,19 | 4,10 | 4,02 | 3,96 |
| 14 | 8,86 | 6,51 | 5,56 | 5,03 | 4,69 | 4,46 | 4,28 | 4,14 | 4,03 | 3,94 | 3,86 | 3,80 |
| 15 | 8,68 | 6,36 | 5,42 | 4,89 | 4,56 | 4,32 | 4,14 | 4,00 | 3,89 | 3,80 | 3,73 | 3,67 |
| 16 | 8,53 | 6,23 | 5,29 | 4,77 | 4,44 | 4,20 | 4,03 | 3,89 | 3,78 | 3,69 | 3,61 | 3,55 |
| 17 | 8,40 | 6,11 | 5,18 | 4,67 | 4,34 | 4,10 | 3,93 | 3,79 | 3,68 | 3,59 | 3,52 | 3,45 |
|  |
| Уровень значимости  |
| K2 | K1 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 161 | 200 | 216 | 225 | 230 | 234 | 237 | 239 | 241 | 242 | 243 | 244 |
| 2 | 18,51 | 19,00 | 19,16 | 19,25 | 19,30 | 19,33 | 19,36 | 19,37 | 19,38 | 19,39 | 19,40 | 19,41 |
| 3 | 10,13 | 9,55 | 9,28 | 9,12 | 9,01 | 8,94 | 8,88 | 8,84 | 8,81 | 8,78 | 8,76 | 8,74 |
| 4 | 7,71 | 6,94 | 6,59 | 6,39 | 6,26 | 6,16 | 6,09 | 6,04 | 6,00 | 5,96 | 5,93 | 5,91 |
| 5 | 6,61 | 5,79 | 5,41 | 5,19 | 5,05 | 4,95 | 4,88 | 4,82 | 4,78 | 4,74 | 4,70 | 4,68 |
| 6 | 5,99 | 5,14 | 4,76 | 4,53 | 4,39 | 4,28 | 4,21 | 4,15 | 4,10 | 4,06 | 4,03 | 4,00 |
| 7 | 5,59 | 4,74 | 4,35 | 4,12 | 3,97 | 3,87 | 3,79 | 3,73 | 3,68 | 3,63 | 3,60 | 3,57 |
| 8 | 5,32 | 4,46 | 4,07 | 3,84 | 3,69 | 3,58 | 3,50 | 3,44 | 3,39 | 3,34 | 3,31 | 3,28 |
| 9 | 5,12 | 4,26 | 3,86 | 3,63 | 3,48 | 3,37 | 3,29 | 3,23 | 3,18 | 3,13 | 3,10 | 3,07 |
| 10 | 4,96 | 4,10 | 3,71 | 3,48 | 3,33 | 3,22 | 3,14 | 3,07 | 3,02 | 2,97 | 2,94 | 2,91 |
| 11 | 4,84 | 3,98 | 3,59 | 3,36 | 3,20 | 3,09 | 3,01 | 2,95 | 2,90 | 2,86 | 2,82 | 2,79 |
| 12 | 4,75 | 3,88 | 3,49 | 3,26 | 3,11 | 3,00 | 2,92 | 2,85 | 2,80 | 2,76 | 2,72 | 2,69 |
| 13 | 4,67 | 3,80 | 3,41 | 3,18 | 3,02 | 2,92 | 2,84 | 2,77 | 2,72 | 2,67 | 2,63 | 2,60 |
| 14 | 4,60 | 3,74 | 3,34 | 3,11 | 2,96 | 2,85 | 2,77 | 2,70 | 2,65 | 2,60 | 2,56 | 2,53 |
| 15 | 4,64 | 3,68 | 3,29 | 3,06 | 2,90 | 2,79 | 2,70 | 2,64 | 2,59 | 2,55 | 2,51 | 2,48 |
| 16 | 4,49 | 3,63 | 3,24 | 3,01 | 2,85 | 2,74 | 2,66 | 2,59 | 2,54 | 2,49 | 2,45 | 2,42 |
| 17 | 4,45 | 3,59 | 3,20 | 2,96 | 2,81 | 2,70 | 2,62 | 2,55 | 2,50 | 2,45 | 2,41 | 2,38 |

Критические точки распределение Стьюдента

 Приложение 6

|  |  |
| --- | --- |
| Число степеней свободы k  | Уровень значимости (двустор. критич. обл) |
| 0,10 | 0,05 | 0,02 | 0,01 | 0,002 | 0,001 |
| 1 | 6.31 | 12.7 | 31.82 | 63.7 | 318.3 | 637 |
| 2 | 2.92 | 4.30 | 6.97 | 9.92 | 22.33 | 31.6 |
| 3 | 2.35 | 3.18 | 4.54 | 5.84 | 10.22 | 12.9 |
| 4 | 2.13 | 2.78 | 3.75 | 4.60 | 7.17 | 8.61 |
| 5 | 2.01 | 2.57 | 3.37 | 4.03 | 5.89 | 6.86 |
| 6 | 1.94 | 2.45 | 3.14 | 3.71 | 5.21 | 5.96 |
| 7 | 1.89 | 2.36 | 3.00 | 3.50 | 4.79 | 5.40 |
| 8 | 1.86 | 2.31 | 2.90 | 3.36 | 4.50 | 5.04 |
| 9 | 1.83 | 2.26 | 2.82 | 3.25 | 4.30 | 4.78 |
| 10 | 1.81 | 2.23 | 2.76 | 3.17 | 4.14 | 4.59 |
| 11 | 1.80 | 2.20 | 2.72 | 3.11 | 4.03 | 4.44 |
| 12 | 1.78 | 2.18 | 2.68 | 3.05 | 3.93 | 4.32 |
| 13 | 1.77 | 2.16 | 2.65 | 3.01 | 3.85 | 4.22 |
| 14 | 1.76 | 2.14 | 2.62 | 2.98 | 3.79 | 4.14 |
| 15 | 1.75 | 2.13 | 2.60 | 2.95 | 3.73 | 4.07 |
| 16 | 1.75 | 2.12 | 2.58 | 2.92 | 3.69 | 4.01 |
| 17 | 1.74 | 2.11 | 2.57 | 2.90 | 3.65 | 3.96 |
| 18 | 1.73 | 2.10 | 2.55 | 2.88 | 3.61 | 3.92 |
| 19 | 1.73 | 2.09 | 2.54 | 2.86 | 3.58 | 3.88 |
| 20 | 1.73 | 2.09 | 2.53 | 2.85 | 3.55 | 3.85 |
| 21 | 1.72 | 2.08 | 2.52 | 2.83 | 3.53 | 3.82 |
| 22 | 1.72 | 2.07 | 2.51 | 2.82 | 3.51 | 3.79 |
| 23 | 1.71 | 2.07 | 2.50 | 2.81 | 3.49 | 3.77 |
| 24 | 1.71 | 2.06 | 2.49 | 2.80 | 3.47 | 3.74 |
| 25 | 1.71 | 2.06 | 2.49 | 2.79 | 3.45 | 3.72 |
| 26 | 1.71 | 2.06 | 2.48 | 2.78 | 3.44 | 3.71 |
| 27 | 1.71 | 2.05 | 2.47 | 2.77 | 3.42 | 3.69 |
| 28 | 1.70 | 2.05 | 2.46 | 2.76 | 3.40 | 3.66 |
| 29 | 1.70 | 2.05 | 2.46 | 2.76 | 3.40 | 3.66 |
| 30 | 1.70 | 2.04 | 2.46 | 2.75 | 3.39 | 3.65 |
| 40 | 1.68 | 2.02 | 2.42 | 2.70 | 3.31 | 3.55 |
| 60 | 1.67 | 2.00 | 2.39 | 2.66 | 3.23 | 3.46 |
| 120 | 1.66 | 1.98 | 2.36 | 2.62 | 3.17 | 3.37 |
|  | 1.64 | 1.96 | 2.33 | 2.58 | 3.09 | 3.29 |
|  | 0.05 | 0.025 | 0.01 | 0.005 | 0.001 | 0.0005 |
| Уровень значимости (односторонняя критическая область) |