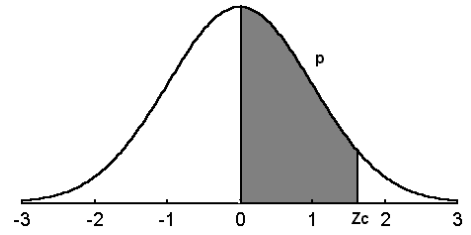


TÁBUA 1: Valores críticos da distribuição normal reduzida

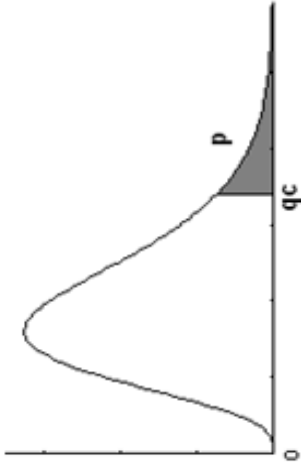
Probabilidades  $p$  tais que  $p = P(0 < Z < z_c)$



| $z_c$ | Segunda decimal |        |        |        |        |        |        |        |        |        | $z_c$ |
|-------|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
|       | 0               | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      |       |
| 0,0   | 0,0000          | 0,0040 | 0,0080 | 0,0120 | 0,0160 | 0,0199 | 0,0239 | 0,0279 | 0,0319 | 0,0359 | 0,0   |
| 0,1   | 0,0398          | 0,0438 | 0,0478 | 0,0517 | 0,0557 | 0,0596 | 0,0636 | 0,0675 | 0,0714 | 0,0753 | 0,1   |
| 0,2   | 0,0793          | 0,0832 | 0,0871 | 0,0910 | 0,0948 | 0,0987 | 0,1026 | 0,1064 | 0,1103 | 0,1141 | 0,2   |
| 0,3   | 0,1179          | 0,1217 | 0,1255 | 0,1293 | 0,1331 | 0,1368 | 0,1406 | 0,1443 | 0,1480 | 0,1517 | 0,3   |
| 0,4   | 0,1554          | 0,1591 | 0,1628 | 0,1664 | 0,1700 | 0,1736 | 0,1772 | 0,1808 | 0,1844 | 0,1879 | 0,4   |
| 0,5   | 0,1915          | 0,1950 | 0,1985 | 0,2019 | 0,2054 | 0,2088 | 0,2123 | 0,2157 | 0,2190 | 0,2224 | 0,5   |
| 0,6   | 0,2257          | 0,2291 | 0,2324 | 0,2357 | 0,2389 | 0,2422 | 0,2454 | 0,2486 | 0,2517 | 0,2549 | 0,6   |
| 0,7   | 0,2580          | 0,2611 | 0,2642 | 0,2673 | 0,2704 | 0,2734 | 0,2764 | 0,2794 | 0,2823 | 0,2852 | 0,7   |
| 0,8   | 0,2881          | 0,2910 | 0,2939 | 0,2967 | 0,2995 | 0,3023 | 0,3051 | 0,3079 | 0,3106 | 0,3133 | 0,8   |
| 0,9   | 0,3159          | 0,3186 | 0,3212 | 0,3238 | 0,3264 | 0,3289 | 0,3315 | 0,3340 | 0,3365 | 0,3389 | 0,9   |
| 1,0   | 0,3413          | 0,3438 | 0,3461 | 0,3485 | 0,3508 | 0,3531 | 0,3554 | 0,3577 | 0,3599 | 0,3621 | 1,0   |
| 1,1   | 0,3643          | 0,3665 | 0,3686 | 0,3708 | 0,3729 | 0,3749 | 0,3770 | 0,3790 | 0,3810 | 0,3830 | 1,1   |
| 1,2   | 0,3849          | 0,3869 | 0,3888 | 0,3907 | 0,3925 | 0,3944 | 0,3962 | 0,3980 | 0,3997 | 0,4015 | 1,2   |
| 1,3   | 0,4032          | 0,4049 | 0,4066 | 0,4082 | 0,4099 | 0,4115 | 0,4131 | 0,4147 | 0,4162 | 0,4177 | 1,3   |
| 1,4   | 0,4192          | 0,4207 | 0,4222 | 0,4236 | 0,4251 | 0,4265 | 0,4279 | 0,4292 | 0,4306 | 0,4319 | 1,4   |
| 1,5   | 0,4332          | 0,4345 | 0,4357 | 0,4370 | 0,4382 | 0,4394 | 0,4406 | 0,4418 | 0,4429 | 0,4441 | 1,5   |
| 1,6   | 0,4452          | 0,4463 | 0,4474 | 0,4484 | 0,4495 | 0,4505 | 0,4515 | 0,4525 | 0,4535 | 0,4545 | 1,6   |
| 1,7   | 0,4554          | 0,4564 | 0,4573 | 0,4582 | 0,4591 | 0,4599 | 0,4608 | 0,4616 | 0,4625 | 0,4633 | 1,7   |
| 1,8   | 0,4641          | 0,4649 | 0,4656 | 0,4664 | 0,4671 | 0,4678 | 0,4686 | 0,4693 | 0,4699 | 0,4706 | 1,8   |
| 1,9   | 0,4713          | 0,4719 | 0,4726 | 0,4732 | 0,4738 | 0,4744 | 0,4750 | 0,4756 | 0,4761 | 0,4767 | 1,9   |
| 2,0   | 0,4773          | 0,4778 | 0,4783 | 0,4788 | 0,4793 | 0,4798 | 0,4803 | 0,4808 | 0,4812 | 0,4817 | 2,0   |
| 2,1   | 0,4821          | 0,4826 | 0,4830 | 0,4834 | 0,4838 | 0,4842 | 0,4846 | 0,4850 | 0,4854 | 0,4857 | 2,1   |
| 2,2   | 0,4861          | 0,4864 | 0,4868 | 0,4871 | 0,4875 | 0,4878 | 0,4881 | 0,4884 | 0,4887 | 0,4890 | 2,2   |
| 2,3   | 0,4893          | 0,4896 | 0,4898 | 0,4901 | 0,4904 | 0,4906 | 0,4909 | 0,4911 | 0,4913 | 0,4916 | 2,3   |
| 2,4   | 0,4918          | 0,4920 | 0,4922 | 0,4925 | 0,4927 | 0,4929 | 0,4931 | 0,4932 | 0,4934 | 0,4936 | 2,4   |
| 2,5   | 0,4938          | 0,4940 | 0,4941 | 0,4943 | 0,4945 | 0,4946 | 0,4948 | 0,4949 | 0,4951 | 0,4952 | 2,5   |
| 2,6   | 0,4953          | 0,4955 | 0,4956 | 0,4957 | 0,4959 | 0,4960 | 0,4961 | 0,4962 | 0,4963 | 0,4964 | 2,6   |
| 2,7   | 0,4965          | 0,4966 | 0,4967 | 0,4968 | 0,4969 | 0,4970 | 0,4971 | 0,4972 | 0,4973 | 0,4974 | 2,7   |
| 2,8   | 0,4974          | 0,4975 | 0,4976 | 0,4977 | 0,4977 | 0,4978 | 0,4979 | 0,4979 | 0,4980 | 0,4981 | 2,8   |
| 2,9   | 0,4981          | 0,4982 | 0,4983 | 0,4983 | 0,4984 | 0,4984 | 0,4985 | 0,4985 | 0,4986 | 0,4986 | 2,9   |
| 3,0   | 0,4987          | 0,4987 | 0,4987 | 0,4988 | 0,4988 | 0,4989 | 0,4989 | 0,4989 | 0,4990 | 0,4990 | 3,0   |
| 3,1   | 0,4990          | 0,4991 | 0,4991 | 0,4991 | 0,4992 | 0,4992 | 0,4992 | 0,4992 | 0,4993 | 0,4993 | 3,1   |
| 3,2   | 0,4993          | 0,4993 | 0,4994 | 0,4994 | 0,4994 | 0,4994 | 0,4994 | 0,4995 | 0,4995 | 0,4995 | 3,2   |
| 3,3   | 0,4995          | 0,4995 | 0,4996 | 0,4996 | 0,4996 | 0,4996 | 0,4996 | 0,4996 | 0,4996 | 0,4997 | 3,3   |
| 3,4   | 0,4997          | 0,4997 | 0,4997 | 0,4997 | 0,4997 | 0,4997 | 0,4997 | 0,4997 | 0,4997 | 0,4998 | 3,4   |
| 3,5   | 0,4998          | 0,4998 | 0,4998 | 0,4998 | 0,4998 | 0,4998 | 0,4998 | 0,4998 | 0,4998 | 0,4998 | 3,5   |
| 3,6   | 0,4998          | 0,4998 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 3,6   |
| 3,7   | 0,4999          | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 3,7   |
| 3,8   | 0,4999          | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,4999 | 0,5000 | 3,8   |
| 3,9   | 0,5000          | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 3,9   |
| 4,0   | 0,5000          | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 0,5000 | 4,0   |

TÁBUA 2: Valores críticos ( $q_c$ ) da distribuição Quiquadrado com  $\nu$  graus de liberdade

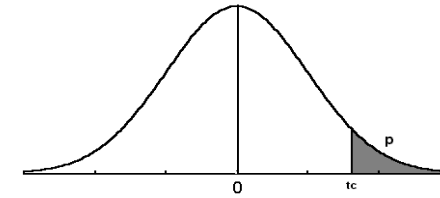
Valores  $q_c$  tais que  $p = P(Q > q_c)$



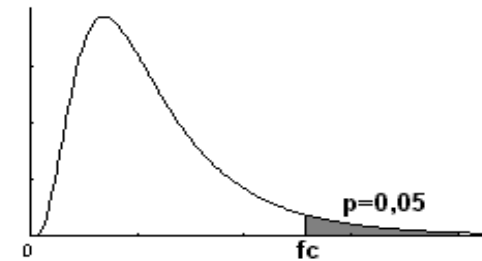
| $\nu$ | Probabilidades ( $p$ ) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |  |
|-------|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|       | 0,990                  | 0,980  | 0,975  | 0,950  | 0,900  | 0,800  | 0,700  | 0,500  | 0,300  | 0,200  | 0,100  | 0,050  | 0,040  | 0,030  | 0,025  | 0,020  | 0,010  | 0,005  | 0,001  |  |
| 1     | 0,000                  | 0,001  | 0,001  | 0,004  | 0,016  | 0,064  | 0,148  | 0,455  | 1,074  | 1,642  | 2,706  | 3,841  | 4,218  | 4,709  | 5,024  | 5,412  | 6,635  | 7,879  | 10,828 |  |
| 2     | 0,020                  | 0,040  | 0,051  | 0,103  | 0,211  | 0,446  | 0,713  | 1,386  | 2,408  | 3,219  | 4,605  | 5,991  | 6,438  | 7,013  | 7,378  | 7,824  | 9,310  | 10,597 | 13,816 |  |
| 3     | 0,115                  | 0,185  | 0,216  | 0,352  | 0,584  | 1,005  | 1,424  | 2,366  | 3,665  | 4,642  | 6,251  | 7,815  | 8,311  | 8,947  | 9,348  | 9,837  | 11,345 | 12,838 | 16,266 |  |
| 4     | 0,297                  | 0,429  | 0,484  | 0,711  | 1,064  | 1,649  | 2,195  | 3,357  | 4,878  | 5,989  | 7,779  | 9,488  | 10,026 | 10,712 | 11,143 | 11,668 | 13,277 | 14,860 | 18,467 |  |
| 5     | 0,554                  | 0,752  | 0,831  | 1,145  | 1,610  | 2,343  | 3,000  | 4,351  | 6,064  | 7,289  | 9,236  | 11,070 | 11,644 | 12,375 | 12,833 | 13,388 | 15,086 | 16,750 | 20,515 |  |
| 6     | 0,872                  | 1,134  | 1,237  | 1,635  | 2,204  | 3,070  | 3,828  | 5,348  | 7,231  | 8,558  | 10,645 | 12,592 | 13,198 | 13,968 | 14,449 | 15,033 | 16,812 | 18,548 | 22,458 |  |
| 7     | 1,239                  | 1,564  | 1,690  | 2,167  | 2,833  | 3,822  | 4,671  | 6,346  | 8,383  | 9,803  | 12,017 | 14,067 | 14,703 | 15,509 | 16,013 | 16,622 | 18,475 | 20,278 | 24,322 |  |
| 8     | 1,646                  | 2,032  | 2,180  | 2,733  | 3,490  | 4,594  | 5,527  | 7,344  | 9,524  | 11,030 | 13,362 | 15,507 | 16,171 | 17,010 | 17,535 | 18,168 | 20,090 | 21,955 | 26,125 |  |
| 9     | 2,088                  | 2,532  | 2,700  | 3,325  | 4,168  | 5,380  | 6,393  | 8,343  | 10,656 | 12,242 | 14,684 | 16,919 | 17,608 | 18,480 | 19,023 | 19,679 | 21,666 | 23,589 | 27,877 |  |
| 10    | 2,558                  | 3,059  | 3,247  | 3,940  | 4,865  | 6,179  | 7,267  | 9,342  | 11,781 | 13,442 | 15,987 | 18,307 | 19,021 | 19,922 | 20,483 | 21,161 | 23,209 | 25,188 | 29,588 |  |
| 11    | 3,053                  | 3,609  | 3,816  | 4,575  | 5,578  | 6,989  | 8,148  | 10,341 | 12,899 | 14,631 | 17,275 | 19,675 | 20,412 | 21,342 | 21,920 | 22,618 | 24,725 | 26,757 | 31,264 |  |
| 12    | 3,571                  | 4,178  | 4,404  | 5,226  | 6,304  | 7,807  | 9,034  | 11,340 | 14,011 | 15,812 | 18,549 | 21,026 | 21,785 | 22,742 | 23,337 | 24,054 | 26,217 | 28,300 | 32,910 |  |
| 13    | 4,107                  | 4,765  | 5,009  | 5,892  | 7,042  | 8,634  | 9,926  | 12,340 | 15,119 | 16,985 | 19,812 | 22,362 | 23,142 | 24,125 | 24,736 | 25,471 | 27,688 | 29,819 | 34,528 |  |
| 14    | 4,660                  | 5,368  | 5,629  | 6,571  | 7,790  | 9,467  | 10,821 | 13,339 | 16,222 | 18,151 | 21,064 | 23,685 | 24,485 | 25,493 | 26,119 | 26,873 | 29,141 | 31,319 | 36,124 |  |
| 15    | 5,229                  | 5,985  | 6,262  | 7,261  | 8,547  | 10,307 | 11,721 | 14,339 | 17,322 | 19,311 | 22,307 | 24,996 | 25,816 | 26,848 | 27,488 | 28,259 | 30,578 | 32,801 | 37,697 |  |
| 16    | 5,812                  | 6,614  | 6,908  | 7,962  | 9,312  | 11,152 | 12,624 | 15,339 | 18,418 | 20,465 | 23,542 | 26,296 | 27,136 | 28,191 | 28,845 | 29,633 | 32,000 | 34,267 | 39,254 |  |
| 17    | 6,408                  | 7,255  | 7,564  | 8,672  | 10,085 | 12,002 | 13,531 | 16,338 | 19,511 | 21,615 | 24,769 | 27,587 | 28,445 | 29,523 | 30,191 | 30,995 | 33,409 | 35,718 | 40,789 |  |
| 18    | 7,015                  | 7,906  | 8,231  | 9,390  | 10,865 | 12,857 | 14,440 | 17,338 | 20,601 | 22,760 | 25,989 | 28,869 | 29,745 | 30,845 | 31,526 | 32,346 | 34,805 | 37,156 | 42,312 |  |
| 19    | 7,633                  | 8,567  | 8,907  | 10,117 | 11,651 | 13,716 | 15,352 | 18,338 | 21,689 | 23,900 | 27,204 | 30,143 | 31,037 | 32,158 | 32,852 | 33,687 | 36,191 | 38,582 | 43,819 |  |
| 20    | 8,260                  | 9,237  | 9,591  | 10,851 | 12,443 | 14,578 | 16,266 | 19,337 | 22,775 | 25,038 | 28,412 | 31,410 | 32,321 | 33,462 | 34,170 | 35,020 | 37,566 | 39,997 | 45,315 |  |
| 21    | 8,897                  | 9,915  | 10,283 | 11,591 | 13,240 | 15,445 | 17,182 | 20,337 | 23,858 | 26,171 | 29,615 | 32,671 | 33,597 | 34,759 | 35,479 | 36,343 | 38,932 | 41,401 | 46,797 |  |
| 22    | 9,542                  | 10,600 | 10,982 | 12,338 | 14,041 | 16,314 | 18,101 | 21,337 | 24,939 | 27,301 | 30,813 | 33,924 | 34,867 | 36,049 | 36,781 | 37,660 | 40,290 | 42,796 | 48,270 |  |
| 23    | 10,196                 | 11,293 | 11,689 | 13,091 | 14,848 | 17,187 | 19,021 | 22,337 | 26,018 | 28,429 | 32,007 | 35,172 | 36,131 | 37,332 | 38,076 | 38,968 | 41,638 | 44,181 | 49,726 |  |
| 24    | 10,856                 | 11,992 | 12,401 | 13,848 | 15,659 | 18,062 | 19,943 | 23,337 | 27,096 | 29,553 | 33,196 | 36,415 | 37,389 | 38,609 | 39,364 | 40,270 | 42,980 | 45,559 | 51,179 |  |
| 25    | 11,524                 | 12,697 | 13,120 | 14,611 | 16,473 | 18,940 | 20,867 | 24,337 | 28,172 | 30,675 | 34,382 | 37,653 | 38,642 | 39,881 | 40,647 | 41,566 | 44,314 | 46,928 | 52,622 |  |
| 26    | 12,198                 | 13,409 | 13,844 | 15,379 | 17,292 | 19,820 | 21,792 | 25,336 | 29,246 | 31,795 | 35,563 | 38,885 | 39,889 | 41,146 | 41,923 | 42,856 | 45,642 | 48,290 | 54,054 |  |
| 27    | 12,879                 | 14,125 | 14,573 | 16,151 | 18,114 | 20,703 | 22,719 | 26,336 | 30,319 | 32,912 | 36,741 | 40,113 | 41,132 | 42,407 | 43,195 | 44,140 | 46,963 | 49,645 | 55,477 |  |
| 28    | 13,565                 | 14,847 | 15,308 | 16,928 | 18,939 | 21,588 | 23,647 | 27,336 | 31,391 | 34,027 | 37,916 | 41,337 | 42,370 | 43,662 | 44,461 | 45,419 | 48,278 | 50,994 | 56,893 |  |
| 29    | 14,256                 | 15,574 | 16,047 | 17,708 | 19,768 | 22,475 | 24,577 | 28,336 | 32,461 | 35,139 | 39,087 | 42,557 | 43,604 | 44,913 | 45,722 | 46,693 | 49,588 | 52,336 | 58,303 |  |
| 30    | 14,953                 | 16,306 | 16,791 | 18,493 | 20,599 | 23,364 | 25,508 | 29,336 | 33,530 | 36,250 | 40,256 | 43,773 | 44,834 | 46,160 | 46,979 | 47,962 | 50,892 | 53,672 | 59,703 |  |

TÁBUA 3: Valores críticos ( $t_c$ ) da distribuição  $t$ -Student com  $\nu$  graus de liberdade

Valores  $t_c$  tais que  $P(T > t_c) = p$



| $\nu$ | Probabilidade ( $p$ ) |       |       |       |       |       |       |       |        |        |        |        |        |        |         |         |         |
|-------|-----------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|---------|---------|---------|
|       | 0,400                 | 0,300 | 0,250 | 0,200 | 0,150 | 0,100 | 0,050 | 0,040 | 0,030  | 0,025  | 0,020  | 0,015  | 0,010  | 0,005  | 0,002   | 0,001   | 0,0005  |
| 1     | 0,325                 | 0,727 | 1,000 | 1,376 | 1,963 | 3,078 | 6,314 | 7,916 | 10,579 | 12,706 | 15,895 | 21,205 | 31,821 | 63,657 | 127,322 | 318,317 | 636,607 |
| 2     | 0,289                 | 0,617 | 0,816 | 1,061 | 1,386 | 1,886 | 2,920 | 3,320 | 3,896  | 4,303  | 4,849  | 5,643  | 6,965  | 9,925  | 14,089  | 22,327  | 31,598  |
| 3     | 0,277                 | 0,584 | 0,765 | 0,978 | 1,250 | 1,638 | 2,353 | 2,605 | 2,951  | 3,182  | 3,482  | 3,896  | 4,541  | 5,841  | 7,453   | 10,215  | 12,924  |
| 4     | 0,271                 | 0,569 | 0,741 | 0,941 | 1,190 | 1,533 | 2,132 | 2,333 | 2,601  | 2,776  | 2,999  | 3,298  | 3,747  | 4,604  | 5,598   | 7,173   | 8,610   |
| 5     | 0,267                 | 0,559 | 0,727 | 0,920 | 1,156 | 1,476 | 2,015 | 2,191 | 2,422  | 2,571  | 2,757  | 3,003  | 3,365  | 4,032  | 4,773   | 5,893   | 6,869   |
| 6     | 0,265                 | 0,553 | 0,718 | 0,906 | 1,134 | 1,440 | 1,943 | 2,104 | 2,313  | 2,447  | 2,612  | 2,829  | 3,143  | 3,707  | 4,317   | 5,208   | 5,959   |
| 7     | 0,263                 | 0,549 | 0,711 | 0,896 | 1,119 | 1,415 | 1,895 | 2,046 | 2,241  | 2,365  | 2,517  | 2,715  | 2,998  | 3,499  | 4,029   | 4,785   | 5,408   |
| 8     | 0,262                 | 0,546 | 0,706 | 0,889 | 1,108 | 1,397 | 1,860 | 2,004 | 2,189  | 2,306  | 2,449  | 2,634  | 2,896  | 3,355  | 3,833   | 4,501   | 5,041   |
| 9     | 0,261                 | 0,543 | 0,703 | 0,883 | 1,100 | 1,383 | 1,833 | 1,973 | 2,150  | 2,262  | 2,398  | 2,574  | 2,821  | 3,250  | 3,690   | 4,297   | 4,781   |
| 10    | 0,260                 | 0,542 | 0,700 | 0,879 | 1,093 | 1,372 | 1,812 | 1,948 | 2,120  | 2,228  | 2,359  | 2,527  | 2,764  | 3,169  | 3,581   | 4,144   | 4,587   |
| 11    | 0,260                 | 0,540 | 0,697 | 0,876 | 1,088 | 1,363 | 1,796 | 1,928 | 2,096  | 2,201  | 2,328  | 2,491  | 2,718  | 3,106  | 3,497   | 4,025   | 4,437   |
| 12    | 0,259                 | 0,539 | 0,695 | 0,873 | 1,083 | 1,356 | 1,782 | 1,912 | 2,076  | 2,179  | 2,303  | 2,461  | 2,681  | 3,055  | 3,428   | 3,930   | 4,318   |
| 13    | 0,259                 | 0,538 | 0,694 | 0,870 | 1,079 | 1,350 | 1,771 | 1,899 | 2,060  | 2,160  | 2,282  | 2,436  | 2,650  | 3,012  | 3,372   | 3,852   | 4,221   |
| 14    | 0,258                 | 0,537 | 0,692 | 0,868 | 1,076 | 1,345 | 1,761 | 1,888 | 2,046  | 2,145  | 2,264  | 2,415  | 2,624  | 2,977  | 3,326   | 3,787   | 4,140   |
| 15    | 0,258                 | 0,536 | 0,691 | 0,866 | 1,074 | 1,341 | 1,753 | 1,878 | 2,034  | 2,131  | 2,249  | 2,397  | 2,602  | 2,947  | 3,286   | 3,733   | 4,073   |
| 16    | 0,258                 | 0,535 | 0,690 | 0,865 | 1,071 | 1,337 | 1,746 | 1,869 | 2,024  | 2,120  | 2,235  | 2,382  | 2,583  | 2,921  | 3,252   | 3,686   | 4,015   |
| 17    | 0,257                 | 0,534 | 0,689 | 0,863 | 1,069 | 1,333 | 1,740 | 1,862 | 2,015  | 2,110  | 2,224  | 2,368  | 2,567  | 2,898  | 3,222   | 3,646   | 3,965   |
| 18    | 0,257                 | 0,534 | 0,688 | 0,862 | 1,067 | 1,330 | 1,734 | 1,855 | 2,007  | 2,101  | 2,214  | 2,356  | 2,552  | 2,878  | 3,197   | 3,611   | 3,922   |
| 19    | 0,257                 | 0,533 | 0,688 | 0,861 | 1,066 | 1,328 | 1,729 | 1,850 | 2,000  | 2,093  | 2,205  | 2,346  | 2,539  | 2,861  | 3,174   | 3,579   | 3,883   |
| 20    | 0,257                 | 0,533 | 0,687 | 0,860 | 1,064 | 1,325 | 1,725 | 1,844 | 1,994  | 2,086  | 2,197  | 2,336  | 2,528  | 2,845  | 3,153   | 3,552   | 3,850   |
| 21    | 0,257                 | 0,532 | 0,686 | 0,859 | 1,063 | 1,323 | 1,721 | 1,840 | 1,988  | 2,080  | 2,189  | 2,328  | 2,518  | 2,831  | 3,135   | 3,527   | 3,819   |
| 22    | 0,256                 | 0,532 | 0,686 | 0,858 | 1,061 | 1,321 | 1,717 | 1,835 | 1,983  | 2,074  | 2,183  | 2,320  | 2,508  | 2,819  | 3,119   | 3,505   | 3,792   |
| 23    | 0,256                 | 0,532 | 0,685 | 0,858 | 1,060 | 1,319 | 1,714 | 1,832 | 1,978  | 2,069  | 2,177  | 2,313  | 2,500  | 2,807  | 3,104   | 3,485   | 3,768   |
| 24    | 0,256                 | 0,531 | 0,685 | 0,857 | 1,059 | 1,318 | 1,711 | 1,828 | 1,974  | 2,064  | 2,172  | 2,307  | 2,492  | 2,797  | 3,091   | 3,467   | 3,745   |
| 25    | 0,256                 | 0,531 | 0,684 | 0,856 | 1,058 | 1,316 | 1,708 | 1,825 | 1,970  | 2,060  | 2,167  | 2,301  | 2,485  | 2,787  | 3,078   | 3,450   | 3,725   |
| 26    | 0,256                 | 0,531 | 0,684 | 0,856 | 1,058 | 1,315 | 1,706 | 1,822 | 1,967  | 2,056  | 2,162  | 2,296  | 2,479  | 2,779  | 3,067   | 3,435   | 3,707   |
| 27    | 0,256                 | 0,531 | 0,684 | 0,855 | 1,057 | 1,314 | 1,703 | 1,819 | 1,963  | 2,052  | 2,158  | 2,291  | 2,473  | 2,771  | 3,057   | 3,421   | 3,690   |
| 28    | 0,256                 | 0,530 | 0,683 | 0,855 | 1,056 | 1,313 | 1,701 | 1,817 | 1,960  | 2,048  | 2,154  | 2,286  | 2,467  | 2,763  | 3,047   | 3,408   | 3,674   |
| 29    | 0,256                 | 0,530 | 0,683 | 0,854 | 1,055 | 1,311 | 1,699 | 1,814 | 1,957  | 2,045  | 2,150  | 2,282  | 2,462  | 2,756  | 3,038   | 3,396   | 3,659   |
| 30    | 0,256                 | 0,530 | 0,683 | 0,854 | 1,055 | 1,310 | 1,697 | 1,812 | 1,955  | 2,042  | 2,147  | 2,278  | 2,457  | 2,750  | 3,030   | 3,385   | 3,646   |
| 35    | 0,255                 | 0,529 | 0,682 | 0,852 | 1,052 | 1,306 | 1,690 | 1,803 | 1,944  | 2,030  | 2,133  | 2,262  | 2,438  | 2,724  | 2,996   | 3,340   | 3,591   |
| 40    | 0,255                 | 0,529 | 0,681 | 0,851 | 1,050 | 1,303 | 1,684 | 1,796 | 1,936  | 2,021  | 2,123  | 2,250  | 2,423  | 2,704  | 2,971   | 3,307   | 3,551   |
| 50    | 0,255                 | 0,528 | 0,679 | 0,849 | 1,047 | 1,299 | 1,676 | 1,787 | 1,924  | 2,009  | 2,109  | 2,234  | 2,403  | 2,678  | 2,937   | 3,261   | 3,496   |
| 60    | 0,254                 | 0,527 | 0,679 | 0,848 | 1,045 | 1,296 | 1,671 | 1,781 | 1,917  | 2,000  | 2,099  | 2,223  | 2,390  | 2,660  | 2,915   | 3,232   | 3,460   |
| 70    | 0,254                 | 0,527 | 0,678 | 0,847 | 1,044 | 1,294 | 1,667 | 1,776 | 1,912  | 1,994  | 2,093  | 2,215  | 2,381  | 2,648  | 2,899   | 3,211   | 3,435   |
| 100   | 0,254                 | 0,526 | 0,677 | 0,845 | 1,042 | 1,290 | 1,660 | 1,769 | 1,902  | 1,984  | 2,081  | 2,202  | 2,364  | 2,626  | 2,871   | 3,174   | 3,391   |

TÁBUA 4: Valores críticos ( $f_c$ ) da distribuição F-Snedecor com ( $v_1; v_2$ ) graus de liberdade $v_1$  = número de graus de liberdade do numerador $v_2$  = número de graus de liberdade do denominadorValores  $f_c$  tais que  $P(F > f_c) = 0,05$ 

| $V_2$ | $v_1$ (graus de liberdade do numerador) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |  |
|-------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
|       | 1                                       | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 12     | 14     | 16     | 18     | 20     | 30     | 50     | 70     | 100    |  |
| 1     | 161,45                                  | 199,50 | 215,71 | 224,58 | 230,16 | 233,99 | 236,77 | 238,88 | 240,54 | 241,88 | 243,90 | 245,36 | 246,46 | 247,32 | 248,01 | 250,09 | 251,77 | 252,49 | 253,04 |  |
| 2     | 18,51                                   | 19,00  | 19,16  | 19,25  | 19,30  | 19,33  | 19,35  | 19,37  | 19,38  | 19,40  | 19,41  | 19,42  | 19,43  | 19,44  | 19,45  | 19,46  | 19,48  | 19,48  | 19,49  |  |
| 3     | 10,13                                   | 9,55   | 9,28   | 9,12   | 9,01   | 8,94   | 8,89   | 8,85   | 8,81   | 8,79   | 8,74   | 8,71   | 8,69   | 8,67   | 8,66   | 8,62   | 8,58   | 8,57   | 8,55   |  |
| 4     | 7,71                                    | 6,94   | 6,59   | 6,39   | 6,26   | 6,16   | 6,09   | 6,04   | 6,00   | 5,96   | 5,91   | 5,87   | 5,84   | 5,82   | 5,80   | 5,75   | 5,70   | 5,68   | 5,66   |  |
| 5     | 6,61                                    | 5,79   | 5,41   | 5,19   | 5,05   | 4,95   | 4,88   | 4,82   | 4,77   | 4,74   | 4,68   | 4,64   | 4,60   | 4,58   | 4,56   | 4,50   | 4,44   | 4,42   | 4,41   |  |
| 6     | 5,99                                    | 5,14   | 4,76   | 4,53   | 4,39   | 4,28   | 4,21   | 4,15   | 4,10   | 4,06   | 4,00   | 3,96   | 3,92   | 3,90   | 3,87   | 3,81   | 3,75   | 3,73   | 3,71   |  |
| 7     | 5,59                                    | 4,74   | 4,35   | 4,12   | 3,97   | 3,87   | 3,79   | 3,73   | 3,68   | 3,64   | 3,57   | 3,53   | 3,49   | 3,47   | 3,44   | 3,38   | 3,32   | 3,29   | 3,27   |  |
| 8     | 5,32                                    | 4,46   | 4,07   | 3,84   | 3,69   | 3,58   | 3,50   | 3,44   | 3,39   | 3,35   | 3,28   | 3,24   | 3,20   | 3,17   | 3,15   | 3,08   | 3,02   | 2,99   | 2,97   |  |
| 9     | 5,12                                    | 4,26   | 3,86   | 3,63   | 3,48   | 3,37   | 3,29   | 3,23   | 3,18   | 3,14   | 3,07   | 3,02   | 2,98   | 2,91   | 2,86   | 2,83   | 2,80   | 2,77   | 2,76   |  |
| 10    | 4,96                                    | 4,10   | 3,71   | 3,48   | 3,33   | 3,22   | 3,14   | 3,07   | 3,02   | 2,98   | 2,91   | 2,86   | 2,83   | 2,80   | 2,77   | 2,70   | 2,64   | 2,61   | 2,59   |  |
| 11    | 4,84                                    | 3,98   | 3,59   | 3,36   | 3,20   | 3,09   | 3,01   | 2,95   | 2,90   | 2,85   | 2,79   | 2,74   | 2,70   | 2,67   | 2,65   | 2,57   | 2,51   | 2,48   | 2,46   |  |
| 12    | 4,75                                    | 3,89   | 3,49   | 3,26   | 3,11   | 3,00   | 2,91   | 2,85   | 2,80   | 2,75   | 2,69   | 2,64   | 2,60   | 2,57   | 2,54   | 2,47   | 2,40   | 2,37   | 2,35   |  |
| 13    | 4,67                                    | 3,81   | 3,41   | 3,18   | 3,03   | 2,92   | 2,83   | 2,77   | 2,71   | 2,67   | 2,60   | 2,55   | 2,51   | 2,48   | 2,46   | 2,38   | 2,31   | 2,28   | 2,26   |  |
| 14    | 4,60                                    | 3,74   | 3,34   | 3,11   | 2,96   | 2,85   | 2,76   | 2,70   | 2,65   | 2,60   | 2,53   | 2,48   | 2,44   | 2,41   | 2,39   | 2,31   | 2,24   | 2,21   | 2,19   |  |
| 15    | 4,54                                    | 3,68   | 3,29   | 3,06   | 2,90   | 2,79   | 2,71   | 2,64   | 2,59   | 2,54   | 2,48   | 2,42   | 2,38   | 2,35   | 2,33   | 2,25   | 2,18   | 2,15   | 2,12   |  |
| 16    | 4,49                                    | 3,63   | 3,24   | 3,01   | 2,85   | 2,74   | 2,66   | 2,59   | 2,54   | 2,49   | 2,42   | 2,37   | 2,33   | 2,30   | 2,28   | 2,19   | 2,12   | 2,09   | 2,07   |  |
| 17    | 4,45                                    | 3,59   | 3,20   | 2,96   | 2,81   | 2,70   | 2,61   | 2,55   | 2,49   | 2,45   | 2,38   | 2,33   | 2,29   | 2,26   | 2,23   | 2,15   | 2,08   | 2,05   | 2,02   |  |
| 18    | 4,41                                    | 3,55   | 3,16   | 2,93   | 2,77   | 2,66   | 2,58   | 2,51   | 2,46   | 2,41   | 2,34   | 2,29   | 2,25   | 2,22   | 2,19   | 2,11   | 2,04   | 2,00   | 1,98   |  |
| 19    | 4,38                                    | 3,52   | 3,13   | 2,90   | 2,74   | 2,63   | 2,54   | 2,48   | 2,42   | 2,38   | 2,31   | 2,26   | 2,21   | 2,18   | 2,16   | 2,07   | 2,00   | 1,97   | 1,94   |  |
| 20    | 4,35                                    | 3,49   | 3,10   | 2,87   | 2,71   | 2,60   | 2,51   | 2,45   | 2,39   | 2,35   | 2,28   | 2,22   | 2,18   | 2,15   | 2,12   | 2,04   | 1,97   | 1,93   | 1,91   |  |
| 21    | 4,32                                    | 3,47   | 3,07   | 2,84   | 2,68   | 2,57   | 2,49   | 2,42   | 2,37   | 2,32   | 2,25   | 2,20   | 2,16   | 2,12   | 2,10   | 2,01   | 1,94   | 1,90   | 1,88   |  |
| 22    | 4,30                                    | 3,44   | 3,05   | 2,82   | 2,66   | 2,55   | 2,46   | 2,40   | 2,34   | 2,30   | 2,23   | 2,17   | 2,13   | 2,10   | 2,07   | 1,98   | 1,91   | 1,88   | 1,85   |  |
| 23    | 4,28                                    | 3,42   | 3,03   | 2,80   | 2,64   | 2,53   | 2,44   | 2,37   | 2,32   | 2,27   | 2,20   | 2,15   | 2,11   | 2,08   | 2,05   | 1,96   | 1,88   | 1,85   | 1,82   |  |
| 24    | 4,26                                    | 3,40   | 3,01   | 2,78   | 2,62   | 2,51   | 2,42   | 2,36   | 2,30   | 2,25   | 2,18   | 2,13   | 2,09   | 2,05   | 2,03   | 1,94   | 1,86   | 1,83   | 1,80   |  |
| 25    | 4,24                                    | 3,39   | 2,99   | 2,76   | 2,60   | 2,49   | 2,40   | 2,34   | 2,28   | 2,24   | 2,16   | 2,11   | 2,07   | 2,04   | 2,01   | 1,92   | 1,84   | 1,81   | 1,78   |  |
| 26    | 4,23                                    | 3,37   | 2,98   | 2,74   | 2,59   | 2,47   | 2,39   | 2,32   | 2,27   | 2,22   | 2,15   | 2,09   | 2,05   | 2,02   | 1,99   | 1,90   | 1,82   | 1,79   | 1,76   |  |
| 27    | 4,21                                    | 3,35   | 2,96   | 2,73   | 2,57   | 2,46   | 2,37   | 2,31   | 2,25   | 2,20   | 2,13   | 2,08   | 2,04   | 2,00   | 1,97   | 1,88   | 1,81   | 1,77   | 1,74   |  |
| 28    | 4,20                                    | 3,34   | 2,95   | 2,71   | 2,56   | 2,45   | 2,36   | 2,29   | 2,24   | 2,19   | 2,12   | 2,06   | 2,02   | 1,99   | 1,96   | 1,87   | 1,79   | 1,75   | 1,73   |  |
| 29    | 4,18                                    | 3,33   | 2,93   | 2,70   | 2,55   | 2,43   | 2,35   | 2,28   | 2,22   | 2,18   | 2,10   | 2,05   | 2,01   | 1,97   | 1,94   | 1,85   | 1,77   | 1,74   | 1,71   |  |
| 30    | 4,17                                    | 3,32   | 2,92   | 2,69   | 2,53   | 2,42   | 2,33   | 2,27   | 2,21   | 2,16   | 2,09   | 2,04   | 1,99   | 1,96   | 1,93   | 1,84   | 1,76   | 1,72   | 1,70   |  |
| 35    | 4,12                                    | 3,27   | 2,87   | 2,64   | 2,49   | 2,37   | 2,29   | 2,22   | 2,16   | 2,11   | 2,04   | 1,99   | 1,94   | 1,91   | 1,88   | 1,79   | 1,70   | 1,66   | 1,63   |  |
| 40    | 4,08                                    | 3,23   | 2,84   | 2,61   | 2,45   | 2,34   | 2,25   | 2,18   | 2,12   | 2,08   | 2,00   | 1,95   | 1,90   | 1,87   | 1,84   | 1,74   | 1,66   | 1,62   | 1,59   |  |
| 60    | 4,00                                    | 3,15   | 2,76   | 2,53   | 2,37   | 2,25   | 2,17   | 2,10   | 2,04   | 1,99   | 1,92   | 1,86   | 1,82   | 1,78   | 1,75   | 1,65   | 1,56   | 1,52   | 1,48   |  |
| 80    | 3,96                                    | 3,11   | 2,72   | 2,49   | 2,33   | 2,21   | 2,13   | 2,06   | 2,00   | 1,95   | 1,88   | 1,82   | 1,77   | 1,73   | 1,70   | 1,60   | 1,51   | 1,46   | 1,43   |  |
| 100   | 3,94                                    | 3,09   | 2,70   | 2,46   | 2,31   | 2,19   | 2,10   | 2,03   | 1,97   | 1,93   | 1,85   | 1,79   | 1,75   | 1,71   | 1,68   | 1,57   | 1,48   | 1,43   | 1,39   |  |

