# **Anhang A: Tabellen**

**Binomialverteilung** A.1

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4				+	-	-	+	-	-	-	-	-	1	-	0.999	0.999	0.999	0.998	0.998	0.997	0.997	966.0	966.0	0.994	0.993	0.991	0.99	0.988	986.0	0.984	
3			-	-	-	-	-	-	0.999	666.0	866.0	866.0	766.0	966.0	966.0	0.993	0.95 0.991 0.999	0.989	0.987	0.984	0.981	0.978	0.974	0.97	996.0	0.961	956.0	0.951	0.945	0.939	(n-x-1
2		-	-	-	0.999	866.0	966.0	0.994	0.992	10 0.599 0.914 0.988 0.999	866.0   586.0   868.0   695.0	12 0.54 0.882 0.98 0.998	0.975	966.0 76.0	15 0.463 0.829 0.964 0.995 0.999	0.44 0.811 0.957 0.993 0.999	0.95	18 0.397 0.774 0.942 0.989 0.998	19 0.377 0.755 0.933 0.987 0.998	0.925	21 0.341 0.717 0.915 0.981	906.0	0.895	24 0.292 0.661 0.884 0.97 0.994 0.999	0.873	0.861	0.85	0.837	0.825	30 0.215 0.554 0.812 0.939 0.984 0.997 0.999	$F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$
-	1	2 0.903 0.998	0.993	4 0.815 0.986	5 0.774 0.977 0.999	796.0	966.0 956 0.996	0.663 0.943 0.994	0.63 0.929 0.992	0.914	0.898	0.882	0.865	14 0.488 0.847	0.829	0.811	17 0.418 0.792	0.774	0.755	0.736	0.717	869.0	0.679	0.661	0.642	0.624	909.0	0.588	0.571	0.554	0 = 1-
		33	22	15	74	35	86	63	63	669	699	.54	513	488	463	144	418	397	377	358	341	324	307	292	277	264	3.25	238	226	215	C) d'u
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 7
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 0.999  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 

**Tab. A.2** Binomial verteilung p = 0.1

0.999 1 0.998 1 0.998 0.999 0.997 0.999 0.999 0.999 0.998 0.997 0.996 0.994 0.993 0 999 0 999 0 997 0 997 0 992 0 992 0 982 0 982 0 982 0 982 0 982 0 982 0 982 0 982 0 982 0 982 
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  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 0.02 0.009 15 14 15 15

**Fab. A.3** Binomial verteilung p = 0.15

0.999 0.998 0.997 0.996 0.994 0.997 0.983 0.944 0.99 (
0.914 0.98 (
0.879 0.967 (
0.839 0.95 (
0.795 0.927 (
0.747 0.901  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 0.31 0.992 0.973 0.901 0.852 0.797 0.738 0.678 0.678 0.678 0.398 0.237 0.179 0.154 0.133 0.098 0.098 0.052 0.64 0.96 0.512 0.896 (0.328 0.737 (0.328 0.577 (0.22 0.577 (0.168 0.577 (0.168 0.328 0.137 (0.069 0.322 (0.069 0.235 0.108 0.035 0.148 (0.002 0.148 0.003 0.003 0.003 (0.004 0.003 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.004 0.003 0.003 0.003 0.003 0.003 0.004 0.004 0.003 0.013 0.002 1 2 2 4 4 9 9 18 19 19 19 22 23 23 24 25 26 26 27

**Tab. A.4** Binomial verteilung p = 0.2

29 28 27 26 25 24 23 22 21 20 13 00 17 16 15 0.999 0.999 0.999 0.998 14 0.999 0.998 0.996 0.994 0.992 3 7 0.99 0.997 0.999 0 0.985 0.995 0.999 0 0.97 0.989 0.997 0 0 0.97 0.985 0.995 0 0 0.90 0.905 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.995 0 0 0.91 0.915 0.995 0 0 0.915 0.915 0 0 0.915 0.915 0 0 0.915 0.915 0 0 0.915 0.915 0 0 0.915 0.915 0 0 0.915 0.915 0 12 17 0.999 0.999 0.998 0.996 0.994 10 0.997 0.995 0.986 0.986 0.97 0.959 0.945 0.929 0.909 0.887 6 0.998 0.998 0.988 0.988 0.981 0.971 0.959 0.925 0.904 0.879 0.851 0.82 0.786 0.999 0.997 0.994 0.99 0.983 0.6 0.557 0.514 9 0.996 0.986 0.976 0.962 0.962 0.428 0.387 0.348 0.99 0.966 0.946 0.92 0.888 
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 4 2 0.061 0.162 0 0.049 0.137 0 0.04 0.115 0 0.032 0.096 0 0.026 0.08 0  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 0.011 0.05 0.031 0.024 0.015 0.015 0.015 0.005 0.005 0.003 0.008 0.316 0.237 0.178 0.133 0.075 0.056 0.042 0.032 0.024 0.024 0.013 0.01 2E-04 2E-04 0.422 4E-04 3E-04 16 

**Fab. A.5** Binomial verteilung p = 0.25

29 28 27 26 25 24 23 22 21 20 19 9 17 0.999 16 0.999 0.999 0.997 0.996 0.994 15 0.999 1 0.998 0.999 0.996 0.999 0.996 0.998 0.996 0.997 0.970 0.995 0.971 0.988 0.971 0.988 14 13 12 17 10 0.999 0.987 0.979 0.967 0.952 0.932 0.908 6 0.996 0.847 2 0.939 1 1 1 1 0.975 0.996 1 1 1 0.975 0.996 1 1 1 0.975 0.996 1 1 1 0.975 0.996 0.999 0.999 0.999 0.997 0.995 0.999 0. 0.985 0.974 0.96 0.94 0.916 0.887 0.852 0.814 0.771 0.627 0.627 0.998 0.996 0.992 9 5 0.999 0.996 0.989 0.975 4 0.998 0.989 0.971 0.942 0.901  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 0.874 0.806 0.73 0.65 0.65 0.027 0.086 0.021 0.068 0.016 0.054 0.009 0.033 0.007 0.026 0.005 0.03 0.973 0.916 0.837 0.744 0.647 0.552 0.463 0.383 0.253 0.202 0.161 2 0.003 0.082 0.329 0.058 0.255 0.020 0.149 0.01 0.085 0.014 0.085 0.001 0.084 0.007 0.047 0.002 0.014 0.002 0.014 0.002 0.014 0.002 0.014 0.002 0.014 0.001 0.01 0.001 0.01 0.001 0.91 0.784 0.652 0.528 0.42 8E-04 6E-04 9 9 0.343 0.24 0.168 0.082 0.058 0.058 0.49 9E-05 7E-05 5E-05 -05 11 2 12 15 14 15 15

**Fab. A.6** Binomial verteilung p = 0.3

29 28 27 26 25 24 23 22 21 20 19 9 0.999 17 0.999 0.998 0.995 16 0.999 0.997 0.995 0.992 0.988 0.998 0.997 0.995 0.991 0.979 0.979 15 0.995 0.985 0.985 0.985 0.966 0.952 0.952 14 0.999 0.998 0.997 0.999 0.994 0.998 0.982 0.997 0.994 0.958 0.948 0.958 0.984 0.988 0.988 0.988 0.988 0.988 0.988 0.987 0.992 0.887 0.987 0.987 0.887 0.987 0.987 0.987 0.987 0.987 0.987 0.987 0.987 0.988 13 7 0.994 0.999 1 1 0.994 0.999 1 0.999 1 0.999 1 0.999 0.997 0.999 0.997 0.999 0.997 0.999 0.997 0.998 0.997 0.998 0.992 0.992 0.998 0.992 0.998 0.997 0.998 0.998 0.997 0.998 0.998 0.977 0.897 0.998 0.998 0.977 0.897 0.998 0.998 0.977 0.998 0.998 0.977 0.998 0.998 0.977 0.998 0.998 0.977 0.998 0.998 0.977 0.998 0.998 0.977 0.998 0.998 0.978 12 17 10 0.999 0.997 6 0.999 0.997 0.994 0.988 0.962 0.94 0.913 0.878 0.792 0.741 0.687 0.994 0.987 0.976 0.933 0.901 0.861 0.861 0.762 0.762 0.647 0.647 0.647 0.998 0.358 9 5 4  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 2 0.957 0.874 0.765 0.647 0.532 0.428 0.337 0.262 0.151 0.113 0.084 0.062 0.045 0.024 0.024 0.017 0.009 0.006 0.004 0.003 0.002 0.002 7E-04 0.001 04 병병 7E-04 0.005 (4E-04 0.005) (2E-04 0.003) (2E-04 0.001) (2E-05 7E-04 0.001) (2E-05 7E-05 7E-05 0.001) (2E-05 7E-05 7E-05 0.001) (2E-05 7E-05 7E-0.718 0.563 0.428 0.319 0.121 0.086 0.086 0.042 0.03 0.049 0.032 0.032 0.003 0.009 0.009 0.002 0.002 0.002 0.275 0.179 0.116 0.075 0.423 

**Fab. A.7** Binomial verteilung p = 0.35

29 28 27 26 25 24 23 22 21 20 0.999 0.999 0.998 0.997 19 0.999 0.997 0.995 0.992 9 17 16 15 0.999 0.999 0.997 0.999 0.998 0.996 0.997 0.993 0.997 0.997 0.997 0.987 0.947 0.947 0.942 0.965 0.864 14 0.766 5 0.695 0.637 0.578 12 17 0.431 10 6 0.997 0.982 0.966 0.966 0.908 0.908 0.865 0.814 0.691 0.624 0.556 0.489 0.425 0.998 0.994 0.995 0.995 0.905 0.858 0.657 0.657 0.258 0.328 0.328 0.328 0.119 0.119 0.999 0.996 0.907 0.907 0.902 0.716 | 7 0 682 | 0.913 | 0.99 | 1 | 0.904 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 0.905 | 9 5 4  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 0.974 2 0.936 0.821 0.683 0.544 0.216 0.648 0.073 0.475 0.078 0.233 0.007 0.105 0.017 0.106 0.017 0.007 0.000 0.004 0.001 0.007 0.001 0.007 0.001 0.003 0.002 0.003 0.001 0.003 0.001 0.003 0.002 0.003 0.001 0.003 0.002 0.003 0.003 0.003 0.004 0.003 0.004 0.003 0.007 90-51 17 4E-07 7 2E-07 9 0.36 

**Tab. A.8** Binomial verteilung p = 0.4

29 28 27 26 25 24 23 22 21 0.999 0.999 0.999 0.995 20 19 0.999 0.996 0.992 0.986 0.998 0.998 0.993 0.988 0.979 00 17 0.999 0.994 0.989 0.981 0.969 0.951 16 0.99 0.983 0.971 0.954 0.999 0.998 0.995 0.93 0.998 0.998 0.996 0.985 0.956 0.956 0.956 0.956 0.82 15 
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**Tab. A.9** Binomial verteilung p = 0.45

29 28 27 26 25 24 23 0.999 22 0.999 0.998 21 0.999 0.999 0.994 0.988 0.979 20 19 0.998 0.995 0.995 0.982 0.969 0.969 0.997 0.986 0.974 0.956 0.932 0.932 9 0.999 6 0.999 1 1 1 1 1 1 0.990 0.996 1 1 1 1 0.997 0.999 1 0.994 0.999 1 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.995 0.771 0.828 0.995 0.055 0.944 0.771 0.868 0.995 0.055 0.945 0.995 0.055 0.944 0.771 0.868 0.995 0.05 17 16 15 0.994 0.999 0.985 0.996 0.968 0.990 0.942 0.979 0.942 0.961 0.798 0.895 0.798 0.895 0.799 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 0.729 0.846 14 5 9 0.941 0.982 0.996 10 0.995 0.962 0.999 0 10 0.895 0.962 0.999 0 10 0.60 0.881 0.952 0 10 0.60 0.881 0.952 0 10 0.60 0.881 0.986 0 10 0.60 0.881 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.888 0 10 0.60 0.60 0.888 0 10 0.60 0.60 0.888 0 10 0.60 0.60 0.888 0 10 0.60 0.60 0.60 0 10 0.60 0.60 0.60 0 10 0.60 0.60 0.60 0 10 0.60 0.60 0.60 0 10 0.60 0.60 0.60 0 10 0.60 0.60 0.60 0 10 0.60 0.60 0.60 0 10 0.60 0.60 0 10 0.60 0.60 0 10 0.60 0.60 0 10 0.60 0.60 0 10 0.60 0.60 0 10 0.60 0 0.172 0.286 ( 0.132 0.229 ( 0.1 0.181 ( 12 17 0.997 0.989 0.971 0.092 10 6 0.999 0.981 0.954 0.91 0.849 0.773 0.685 0.593 0.512 0.412 0.332 0.262 0.202 0.154 0.084 9 5 4  $F_{n,p}(x) = 1 - F_{n,1-p}(n-x-1)$ 0.938 2 0.5 0.344 0.227 0.145 1E-03 0.011 5E-04 0.006 1E-04 0.003 1E-05 9E-04 1E-05 1E-04 1E-05 1E-05 1E-05 1E-05 1E-05 1E-05 1E-07 0.5 0.313 0.188 0.109 0.063 0.035 0.02 1E-07 -07 8 8 0.25 0.053 0.063 0.016 0.008 0.004 6E-08 3E-08 1E-08 7E-09 4E-09 109 

**Fab. A.10** Binomialverteilung p = 0.5

#### A.2 Standardnormalverteilung

In der oberen Tabelle sind die Werte der Verteilungsfunktion der Standardnormalverteilung zu gegebenen Werten tabelliert. In der unteren Tabelle, die man meistens für Tests und Konfidenzintervalle braucht, sind die Quantile (die "x-Werte") der Standardnormalverteilung zu gegebenen Wahrscheinlichkeiten dargestellt.

 Tab. A.11
 Werte der Standardnormalverteilung und Quantile

	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	0.5		0.50797831	0.51196647	0.51595344	0.51993881	0.52392218	0.52790317	0.53188137	0.53585639
0.1	0.539827837	0.54379531	0.54775843	0.55171679	0.55567	0.55961769	0.56355946	0.56749493	0.57142372	0.57534543
0.2	0.579259709	0.58316616	0.58706442	0.59095412	0.59483487	0.59870633	0.60256811	0.60641987	0.61026125	0.61409188
0.3	0.617911422	0.62171952	0.62551583	0.62930002	0.63307174	0.63683065	0.64057643	0.64430875	0.64802729	0.65173173
0.4	0.655421742	0.65909703	0.66275727	0.66640218	0.67003145	0.67364478	0.67724189	0.68082249	0.6843863	0.68793305
0.5	0.691462461	0.69497427	0.69846821	0.70194403	0.70540148	0.70884031	0.71226028	0.71566115	0.71904269	0.72240468
0.6	0.725746882	0.7290691	0.73237111	0.73565271	0.7389137	0.74215389	0.74537309	0.7485711	0.75174777	0.75490291
0.7	0.758036348	0.76114793	0.7642375	0.76730491	0.77035	0.77337265	0.77637271	0.77935005	0.78230456	0.78523612
0.8	0.788144601	0.79102991	0.79389195	0.79673061	0.79954581	0.80233746	0.80510548	0.8078498	0.81057035	0.81326706
0.9	0.815939875	0.81858875	0.82121362	0.82381446	0.82639122	0.82894387	0.83147239	0.83397675	0.83645694	0.83891294
1	0.841344746	0.84375235	0.84613577	0.848495	0.85083005	0.85314094	0.8554277	0.85769035	0.85992891	0.86214343
1.1	0.864333939	0.86650049	0.86864312	0.87076189	0.87285685	0.87492806	0.8769756	0.87899952	0.88099989	0.8829768
1.2	0.88493033	0.88686055	0.88876756	0.89065145	0.8925123	0.89435023	0.89616532	0.89795768	0.89972743	0.90147467
1.3	0.903199515	0.90490208	0.90658249	0.90824086	0.90987733	0.91149201	0.91308504	0.91465655	0.91620668	0.91773556
1.4	0.919243341	0.92073016	0.92219616	0.92364149	0.9250663	0.92647074	0.92785496	0.92921912	0.93056338	0.93188788
1.5	0.933192799		0.93574451	0.93699164	0.93821982	0.93942924	0.94062006	0.94179244	0.94294657	0.9440826
1.6	0.945200708	0.94630107	0.94738386	0.94844925	0.94949742	0.95052853	0.95154277	0.95254032	0.95352134	0.95448602
1.7	0.955434537	0.95636706	0.95728378	0.95818486	0.95907049	0.95994084	0.9607961	0.96163643	0.96246202	0.96327304
1.8	0.964069681	0.96485211	0.9656205	0.96637503	0.96711588	0.96784323	0.96855724	0.96925809	0.96994596	0.97062102
1.9	0.97128344	0.97193339	0.97257105	0.97319658	0.97381016	0.97441194	0.9750021	0.97558081	0.97614824	0.97670453
2	0.977249868	0.97778441	0.97830831	0.97882173	0.97932484	0.97981778	0.98030073	0.98077383	0.98123723	0.9816911
2.1	0.982135579	0.98257082	0.98299698	0.98341419	0.98382262	0.98422239	0.98461367	0.98499658	0.98537127	0.98573788
2.2	0.986096552	0.98644742	0.98679062	0.98712628	0.98745454	0.98777553	0.98808937	0.98839621	0.98869616	0.98898934
2.3	0.98927589	0.98955592	0.98982956	0.99009692	0.99035813	0.99061329	0.99086253	0.99110596	0.99134368	0.99157581
2.4	0.991802464	0.99202374	0.99223975	0.99245059	0.99265637	0.99285719	0.99305315	0.99324435	0.99343088	0.99361285
2.5	0.993790335	0.99396344	0.99413226	0.99429687	0.99445738	0.99461385	0.99476639	0.99491507	0.99505998	0.9952012
2.6	0.995338812	0.99547289	0.99560351	0.99573076	0.9958547	0.99597541	0.99609297	0.99620744	0.99631889	0.9964274
2.7	0.996533026	0.99663584	0.9967359	0.99683328	0.99692804	0.99702024	0.99710993	0.99719719	0.99728206	0.9973646
2.8	0.99744487	0.99752293	0.99759882	0.9976726	0.99774432	0.99781404	0.99788179	0.99794764	0.99801162	0.99807379
2.9	0.998134187	0.99819286	0.99824984	0.99830519	0.99835894	0.99841113	0.9984618	0.998511	0.99855876	0.99860511
3	0.998650102	0.99869376	0.99873613	0.99877723	0.99881711	0.99885579	0.99889332	0.99892971	0.998965	0.99899922
3.1	0.999032397	0.99906456	0.99909574	0.99912597	0.99915526	0.99918365	0.99921115	0.99923781	0.99926362	0.99928864
3.2	0.999312862	0.99933633	0.99935905	0.99938105	0.99940235	0.99942297	0.99944294	0.99946226	0.99948096	0.99949906
3.3	0.999516576	0.99953352	0.99954991	0.99956577	0.99958111	0.99959594	0.99961029	0.99962416	0.99963757	0.99965054
3.4	0.999663071	0.99967519	0.99968689	0.99969821	0.99970914	0.99971971	0.99972991	0.99973977	0.99974929	0.99975849
3.5	0.999767371	0.99977595	0.99978423	0.99979222	0.99979994	0.99980738	0.99981457	0.99982151	0.9998282	0.99983466
3.6	0.999840891	0.9998469	0.9998527	0.99985829	0.99986368	0.99986888	0.99987389	0.99987872	0.99988338	0.99988787
3.7	0.9998922	0.99989637	0.99990039	0.99990426	0.99990799	0.99991158	0.99991504	0.99991838	0.99992159	0.99992468
3.8	0.999927652	0.99993052	0.99993327	0.99993593	0.99993848	0.99994094	0.99994331	0.99994558	0.99994777	0.99994988
3.9	0.999951904	0.99995385	0.99995573	0.99995753	0.99995926	0.99996092	0.99996253	0.99996406	0.99996554	0.99996696
4	0.999968329	0.99996964	0.9999709	0.99997211	0.99997327	0.99997439	0.99997546	0.99997649	0.99997748	0.99997843
4.1	0.999979342	0.99998022	0.99998106	0.99998186	0.99998263	0.99998338	0.99998409	0.99998477	0.99998542	0.99998605
4.2	0.999986654	0.99998723	0.99998778	0.99998832	0.99998882	0.99998931	0.99998978	0.99999023	0.99999066	0.99999107
4.3	0.99999146	0.99999184	0.9999922	0.99999254	0.99999288	0.99999319	0.9999935	0.99999379	0.99999407	0.99999433
4.4	0.999994587	0.99999483	0.99999506	0.99999529	0.9999955	0.99999571	0.9999959	0.99999609	0.99999627	0.99999644
O	Pi-1/Fi		-1-							
Quantile	für Konfidenzin			00.00	00.001	05.001	07.56	00.00	00.55	00.00
p	50.0%	60.0%	70.0%	80.0%	90.0%	95.0%	97.5%	99.0%	99.5%	99.9%
X p	0	0.2533471	0.52440051	0.84162123	1.28155157	1.64485363	1.95996398	2.32634787	2.5758293	3.09023231
4() 4 4	/···	A(11) = 4 5°	4.5	φ() 0 fo	45					
$\Phi(-x)=1-\Phi$	(X)	$\Phi(x) \approx 1 \text{ für}$	x > 4.5	$\Phi(x) \approx 0$ für	x < -4.5		$\chi_{p} = -\chi_{1-p}$			

## A.3 Quantile der t-Verteilung

**Tab. A.12** Quantile  $t_f(p)$  der t-Verteilung

	f										
p		1	2	3	4	5	6	7	8	9	10
-	60.0%	0.3249197	0.28867513						0.2619211		
	70.0%	0.72654253						0.54910966			
	_	0.72004203	0.6172134								
	75.0%	1	0.81649658				0.7175582	0.71114178			
	80.0%	1.37638192	1.06066017			0.91954378	0.90570329	0.89602964	0.88888952	0.88340386	0.87905783
	90.0%	3.07768354	1.88561808	1.63774435	1.53320627	1.47588405	1.43975575	1.41492393	1.39681531	1.38302874	1.37218364
	95.0%	6.31375151	2.91998558			2.01504837	1.94318028	1.89457861	1.85954804	1.83311293	1.81246112
	97.5%	12.7062047	4.30265273					2.36462425	2.30600414		2.22813885
					3.74694739			2.99795157			
	99.0%	31.820516	6.96455673			3.36493	3.1426684				The state of the s
	99.5%	63.6567412	9.9248432					3.4994833	3.35538733	3.24983554	3.16927267
	99.9%	318.308839	22.3271248	10.2145319	7.17318222	5.89342953	5.20762624	4.78528963	4.50079093	4.29680566	4.14370049
	f										
_	\ '	44	40	42	44	45	40	47	40	40	20
р		11	12	13	14	15	16	17	18	19	20
	60.0%	0.25955586	0.25903275		0.25821265			0.25734701			
	70.0%	0.53993788	0.53861767	0.53750409	0.53655218	0.53572913	0.53501045	0.53437748	0.53381575	0.53331388	0.53286279
	75.0%	0.69744533	0.69548287	0.6938293	0.69241707	0.69119695	0.69013225	0.68919508	0.68836381	0.68762146	0.6869545
	80.0%	0.87552998	0.87260929		0.86805478		0.864667	0.86327902			0.85996444
	90.0%	1.36343032	1.35621733		1.34503037			1.33337939		1.32772821	1.32534071
-	95.0%	1.79588482	1.78228756		1.76131014			1.73960673			
	97.5%	2.20098516	2.17881283		2.14478669		2.1199053				2.08596345
	99.0%	2.71807918	2.68099799	2.65030884	2.62449407	2.6024803	2.58348719	2.56693398	2.55237963	2.53948319	2.527977
	99.5%	3.10580652	3.05453959		2.97684273						
	99.9%	4.02470104	3.92963326		3.78739024			3.64576738		3.57940015	The same of the sa
	33.370	4.02410104	3.32303320	3.03130233	3.10133024	3.13203443	3.00013413	3.04310130	3.01040400	3.37 3400 13	3.33100034
						-					
	f										
p		21	22	23	24	25	26	27	28	29	30
	60.0%	0.25657995	0.25643203	0.25629706	0.2561734	0.25605968	0.25595477	0.25585766	0.25576752	0.25568363	0.25560536
	70.0%	0.53245515	0.53208496	0.5317473						0.5302144	0.530019
-											
	75.0%	0.68635199									0.68275569
	80.0%	0.85907404	0.85826605								
	90.0%	1.32318787	1.32123674	1.31946024	1.31783593	1.31634507	1.31497186	1.31370291	1.31252678	1.31143365	1.31041503
	95.0%	1.7207429	1.71714437	1.71387153	1.71088208	1.70814076	1.70561792	1.70328845	1.70113093	1.69912703	1.69726089
	97.5%	2.07961384	2.07387307	2.06865761				2.05183052			2.04227246
	99.0%	2.51764802	2.50832455					2.47265991	2.4671401		
	99.5%	2.83135956	2.81875606							2.7563859	
	99.9%	3.52715367	3.50499203	3.48496437	3.4667773	3.45018873	3.43499718	3.42103362	3.40815518	3.39624029	3.38518487
	f										
_	'	24	22	22	24	25	20	27	20	20	40
р		31	32	33	34	35	36	37	38	39	40
	60.0%	0.25553217									
	70.0%	0.52983632	0.52966513	0.5295044	0.52935319			0.52894893	0.52882845	0.52871419	0.52860568
	75.0%	0.68248631	0.68223392	0.68199698	0.6817741	0.68156408	0.68136582	0.68117838	0.68100088	0.68083256	0.68067272
	80.0%	0.8533703	0.85299845	0.85264942				0.85144403		0.85093502	0.8506998
	90.0%	1.30946355	1.30857279						1.3042302		1.30307705
										1.68487512	
	95.0%		1.69388875	1.69236031			1.68829771	1.68709362	1.68595446		
			2.03693334			2.03010793				2.02269092	
			2.44867763								
			2.73848148								
			3.36530593							3.31278808	
	55.570	3.01703320	3.00000000	5.00000120	3.041 3043 1	0.0400432	J.00202420	5.02000100	5.01502500	J.U 12 1 0000	3.00001111
	f										
p		41	42	43	44	45	46	47	48	49	50
	60.0%	0.25499728	0.25495784	0.25492025	0.25488438	0.2548501	0.25481732	0.25478594	0.25475587	0.25472703	0.25469934
			0.52840425			0.52813585				0.52782937	
								0.67974557			
	75.0%				0.68010654					0.67952965	
	80.0%		0.85026328					0.84933591			0.84886924
	90.0%	1.30254336	1.30203549	1.30155161	1.30109006	1.30064933	1.30022805	1.29982495	1.29943888	1.29906878	1.29871369
	95.0%	1.682878	1.68195236			1.67942739				1.67655089	
		2.01954097			2.01536757			2.01174051		2.00957524	
7											
-	99.0%		2.41847036							2.40489176	
	99.5%		2.69806619								
	99.9%	3.30127289	3.29595053	3.29088982	3.28607195	3.28147985	3.27709803	3.27291238	3.26891002	3.26507917	3.26140906
_											

# A.4 Quantile der $\chi^2$ -Verteilung

**Tab. A.13** Quantile  $\chi_f^2(p)$  der  $\chi^2$ -Verteilung

f										
p	1	2	3	4	5	6	7	8	9	10
0.5%	3.927E-05		0.07172177	0.20698909	0.4117419	0.67572678	0.98925568	1.34441309	1.7349329	2.15585648
1.0%	0.00015709		0.1148318	0.29710948		0.87209033	1.23904231	1.64649737	2.08790074	2.55821216
2.5%	0.00098207	0.05063562	0.21579528	0.48441856		1.23734425	1.68986918		2.7003895	3.24697278
5.0%	0.00393214	0.10258659		0.71072302	1.14547623	1.63538289	2.16734991		3.32511284	3.94029914
10.0%	0.01579077	0.21072103	0.58437437	1.06362322	1.61030799		2.83310692		4.16815901	4.86518205
20.0%	0.06418475	0.4462871	1.00517401	1.64877662	2.34253431	3.07008841	3.82232191		5.38005321	6.17907926
25.0%	0.10153104		1.2125329							6.73720077
40.0%	0.2749959	1.02165125	1.8691684	2.75284268	3.65549962	4.57015381	5.49323486		7.3570345	8.29547176
50.0%	0.45493642	1.38629436		3.35669398	4.35146019	5.34812063	6.3458112	7.3441215	8.34283269	9.34181777
60.0%	0.7083263	1.83258146	2.94616607	4.04462649	5.13186707		7.28320763		9.41364009	10.4732362
75.0%	1.3233037	2.77258872	4.10834494		6.62567976		9.03714755	10.218855	11.3887514	12.5488614
80.0%	1.64237442	3.21887582				8.55805972	9.8032499		12.2421455	13.4419576
90.0%	2.70554345	4.60517019		7.77944034	9.2363569	10.6446407	12.0170366		14.6836566	15.9871792
95.0%	3.84145882	5.99146455	7.8147279	9.48772904	11.0704977	12.5915872	14.0671404	15.5073131	16.9189776	18.3070381
97.5%		7.37775891	9.3484036			14.4493753		17.5345461	19.0227678	20.4831774
99.0%	5.02388619 6.6348966	9.21034037	11.3448667	11.1432868 13.2767041	12.832502 15.0862725	16.8118938	16.0127643 18.4753069	20.090235	21.6659943	23.2092512
99.5%						18.5475842	20.2777399			
	7.87943858	10.5966347	12.8381565	14.860259	16.7496023			21.954955	23.5893508	25.1881796
99.9%	10.8275662	13.8155106	16.2662362	18.466827	20.5150057	22.4577445	24.3218863	26.1244816	27.8771649	29.5882984
1	1.1									
p 0.500	11	12	13	14	15	16	17	18	19	20
0.5%	2.60322189	3.07382364			4.60091557		5.6972171		6.84397145	7.43384426
1.0%	3.05348411	3.57056897	4.10691547	4.66042506	5.22934888	5.81221247	6.40775978	7.0149109	7.63272965	8.26039833
2.5%	3.81574825	4.40378851	5.00875051	5.6287261	6.2621378	6.90766435	7.56418645		8.90651648	9.59077739
5.0%	4.57481308	5.22602949	5.89186434		7.26094393	7.96164557	8.6717602	9.39045508	10.1170131	10.8508114
10.0%	5.57778479	6.30379606	7.04150458	7.78953361	8.54675624	9.31223635	10.0851863	10.8649361	11.65091	12.4426092
20.0%	6.98867351	7.80732768			10.306959	11.1521165	12.0022657	12.8569531	13.7157897	14.5784392
25.0%	7.58414279					11.9122197	12.7919264		14.5619967	15.4517735
40.0%	9.23728542	10.1819714	11.1291399		13.0297496	13.9827363	14.9372718	15.8932117	16.850433	17.8088295
50.0%	10.3409981	11.3403224	12.3397559	13.3392741	14.3388595	15.3384989	16.3381824	17.3379024	18.3376529	19.3374292
60.0%	11.5298338	12.583838	13.635571	14.6852943	15.733223	16.7795367	17.8243873	18.8679041	19.9101989	20.9513684
75.0%	13.7006927	14.8454037			18.2450856	19.3688602	20.4886762		22.7178067	23.827692
80.0%	14.6314205		16.984797			20.4650793	21.6145605		23.9004172	25.0375056
90.0%	17.2750085				22.3071296	23.5418289	24.7690353		27.203571	28.4119806
95.0%	19.6751376	21.0260698	22.3620325	23.6847913	24.9957901	26.2962276	27.5871116		30.1435272	31.4104328
97.5%	21.9200493	23.3366642	24.7356049	26.118948	27.4883929	28.8453507	30.1910091	31.5263784	32.8523269	34.1696069
99.0%	24.7249703	26.2169673	27.6882496		30.5779142	31.9999269	33.4086636		36.1908691	37.5662348
99.5%	26.7568489	28.2995188	29.8194712	31.3193496	32.8013206	34.2671865	35.7184657	37.1564515	38.5822566	39.9968463
99.9%	31.2641336	32.9094904	34.528179	36.1232737	37.6972982	39.2523548	40.7902167	42.3123963	43.820196	45.3147466
f	2000				5-20-24	2000				62172
p f	21	22	23	24	25	26	27	28	29	30
0.5%	8.03365342	8.6427164	9.26042478	9.8862335	10.5196521	11.1602374	11.8075874	12.4613359	13.1211489	13.7867199
0.5% 1.0%	8.03365342 8.89719794	8.6427164 9.54249234	9.26042478 10.1957156	9.8862335 10.8563615	10.5196521 11.5239754	11.1602374 12.1981469	11.8075874 12.8785044	12.4613359 13.5647098	13.1211489 14.2564546	13.7867199 14.9534565
0.5% 1.0% 2.5%	8.03365342 8.89719794 10.2828978	8.6427164 9.54249234 10.9823207	9.26042478 10.1957156 11.6885519	9.8862335 10.8563615 12.4011502	10.5196521 11.5239754 13.11972	11.1602374 12.1981469 13.843905	11.8075874 12.8785044 14.5733827	12.4613359 13.5647098 15.3078606	13.1211489 14.2564546 16.0470717	13.7867199 14.9534565 16.7907723
0.5% 1.0% 2.5% 5.0%	8.03365342 8.89719794 10.2828978 11.5913052	8.6427164 9.54249234 10.9823207 12.3380146	9.26042478 10.1957156 11.6885519 13.0905142	9.8862335 10.8563615 12.4011502 13.848425	10.5196521 11.5239754 13.11972 14.6114076	11.1602374 12.1981469 13.843905 15.3791566	11.8075874 12.8785044 14.5733827 16.1513958	12.4613359 13.5647098 15.3078606 16.927875	13.1211489 14.2564546 16.0470717 17.7083662	13.7867199 14.9534565 16.7907723 18.492661
0.5% 1.0% 2.5% 5.0% 10.0%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558	9.8862335 10.8563615 12.4011502 13.848425 15.6586841	10.5196521 11.5239754 13.11972 14.6114076 16.473408	11.1602374 12.1981469 13.843905 15.3791566 17.291885	11.8075874 12.8785044 14.5733827 16.1513958 18.113896	12.4613359 13.5647098 15.3078606 16.927875 18.9392424	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436	13.7867199 14.9534565 16.7907723 18.492661 20.5992346
0.5% 1.0% 2.5% 5.0% 10.0% 20.0%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598 15.4446084	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932 16.3140398	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558 17.1865059	9.8862335 10.8563615 12.4011502 13.848425 15.6586841 18.0618043	10.5196521 11.5239754 13.11972 14.6114076 16.473408 18.9397545	11.1602374 12.1981469 13.843905 15.3791566 17.291885 19.820194	11.8075874 12.8785044 14.5733827 16.1513958 18.113896 20.7029764	12.4613359 13.5647098 15.3078606 16.927875 18.9392424 21.5879693	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436 22.475052	13.7867199 14.9534565 16.7907723 18.492661 20.5992346 23.3641146
0.5% 1.0% 2.5% 5.0% 10.0% 20.0% 25.0%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598 15.4446084 16.3443838	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932 16.3140398 17.2396194	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558 17.1865059 18.1372967	9.8862335 10.8563615 12.4011502 13.848425 15.6586841 18.0618043 19.0372525	10.5196521 11.5239754 13.11972 14.6114076 16.473408 18.9397545 19.9393409	11.1602374 12.1981469 13.843905 15.3791566 17.291885 19.820194 20.8434311	11.8075874 12.8785044 14.5733827 16.1513958 18.113896 20.7029764 21.749405	12.4613359 13.5647098 15.3078606 16.927875 18.9392424 21.5879693 22.6571557	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436 22.475052 23.5665861	13.7867199 14.9534565 16.7907723 18.492661 20.5992346 23.3641146 24.4776077
0.5% 1.0% 2.5% 5.0% 10.0% 20.0% 25.0% 40.0%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598 15.4446084 16.3443838 18.7683091	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932 16.3140398 17.2396194 19.728791	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558 17.1865059 18.1372967 20.6902042	9.8862335 10.8563615 12.4011502 13.848425 15.6586841 18.0618043 19.0372525 21.6524856	10.5196521 11.5239754 13.11972 14.6114076 16.473408 18.9397545 19.9393409 22.6155789	11.1602374 12.1981469 13.843905 15.3791566 17.291885 19.820194 20.8434311 23.5794337	11.8075874 12.8785044 14.5733827 16.1513958 18.113896 20.7029764 21.749405 24.5440047	12.4613359 13.5647098 15.3078606 16.927875 18.9392424 21.5879693 22.6571557 25.5092507	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436 22.475052 23.5665861 26.4751344	13.7867199 14.9534565 16.7907723 18.492661 20.5992346 23.3641146 24.4776077 27.4416221
0.5% 1.0% 2.5% 5.0% 10.0% 20.0% 25.0% 40.0% 50.0%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598 15.4446084 16.3443838 18.7683091 20.3372276	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932 16.3140398 17.2396194 19.728791 21.3370448	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558 17.1865059 18.1372967 20.6902042 22.3368784	9.8862335 10.8563615 12.4011502 13.848425 15.6586841 18.0618043 19.0372525 21.6524856 23.3367263	10.5196521 11.5239754 13.11972 14.6114076 16.473408 18.9397545 19.9393409 22.6155789 24.3365867	11.1602374 12.1981469 13.843905 15.3791566 17.291885 19.820194 20.8434311 23.5794337 25.3364581	11.8075874 12.8785044 14.5733827 16.1513958 18.113896 20.7029764 21.749405 24.5440047 26.3363393	12.4613359 13.5647098 15.3078606 16.927875 18.9392424 21.5879693 22.6571557 25.5092507 27.3362292	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436 22.475052 23.5665861 26.4751344 28.3361269	13.7867199 14.9534565 16.7907723 18.492661 20.5992346 23.3641146 24.4776077 27.4416221 29.3360315
0.5% 1.0% 2.5% 5.0% 10.0% 20.0% 25.0% 40.0% 50.0%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598 15.4446084 16.3443838 18.7683091 20.3372276 21.9914975	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932 16.3140398 17.2396194 19.728791 21.3370448 23.0306609	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558 17.1865059 18.1372967 20.6902042 22.3368784 24.0689248	9.8862335 10.8563615 12.4011502 13.848425 15.6586841 18.0618043 19.0372525 21.6524856 23.3367263 25.1063482	10.5196521 11.5239754 13.11972 14.6114076 16.473408 18.9397545 19.9393409 22.6155789 24.3365867 26.142984	11.1602374 12.1981469 13.843905 15.3791566 17.291885 19.820194 20.8434311 23.5794337 25.3364581 27.1788796	11.8075874 12.8785044 14.5733827 16.1513958 18.113896 20.7029764 21.749405 24.5440047 26.3363393 28.2140781	12.4613359 13.5647098 15.3078606 16.927875 18.9392424 21.5879693 22.6571557 25.5092507 27.3362292 29.2486184	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436 22.475052 23.5665861 26.4751344 28.3361269 30.282536	13.7867199 14.9534565 16.7907723 18.492661 20.5992346 23.3641146 24.4776077 27.4416221 29.3360315 31.3158632
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0.5% 1.0% 1.0% 2.5% 5.0% 40.0% 50.0% 60.0% 75.0% 99.0% 99.5% 1.0% 2.5% 1.0% 90.0% 97.5% 99.9%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598 15.4446084 16.3443838 18.7683091 20.3372276 21.9914975 24.934777 26.1710999 29.6150894 32.6705733 35.4788759 38.9321727 41.4010648 46.797038 31.44577674 15.6554564 47.5387386 21.4335645 24.2550564 25.3901393 28.4086825 30.3359425 32.348692 32.348692 37.3591399 35.870759 37.3591399 34.4217338 44.9853433 48.2318896 52.1913948 55.0027039	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932 16.3140398 17.2396194 19.728791 21.3370448 23.0306609 26.039265 27.301454 30.8132823 33.9244385 42.795655 48.2679423 32 15.1340321 16.3622155 18.2907649 20.0719135 22.2705945 25.1477851 25.1477851 26.304106 29.3762873 31.33588591 33.3808633 36.9729821 34.4663128 46.1942595 49.4804377 53.4887718 56.328115	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558 17.1865059 18.1372967 20.6902042 22.3368784 24.0689248 27.141336 28.4287925 32.0068997 35.1724616 38.0756273 41.6383981 44.1812752 49.7282325 33 15.8152744 17.0735137 19.0466615 20.866634 23.1101967 26.0422156 27.2194412 30.3444103 32.3357809 34.4125885 38.057529 39.57179 47.3998839 50.7250801 54.7756308 57.64844453	9.8862335 10.8563615 12.4011502 13.848425 15.6586841 18.061804 19.0372525 21.6524856 28.24115 29.5533162 33.1962443 36.4150285 39.364077 42.9798201 45.5585119 51.1785978 34 16.5012725 17.7891469 19.8062529 21.6642807 23.952533 26.9382694 28.1360797 31.3130273 33.357074 44.9931575 44.6931575 48.6023674 51.9659952 46.6069087 56.9669987 56.9669987	10.5196521 11.5239754 13.11972 14.6114076 16.473408 18.9397545 19.9393409 22.6155789 24.3365867 26.142984 29.3388503 37.6524881 40.6464691 44.3441049 46.9278902 52.6196558 35 17.1918203 18.5089262 20.5693766 22.4550152 24.7966548 27.8358737 29.0539637 32.282116 34.3356381 34.746058 40.2227899 41.7779633 44.76967884 49.8018496 53.2033485 57.3420734 60.2747709	11.1602374 12.1981469 13.843905 15.3791566 17.291885 19.820194 20.8434311 23.5794337 25.3364581 27.1788796 30.4345654 31.3946541 35.5631713 38.8851387 41.9231701 45.6416827 48.2998823 54.0519624  36 17.8867265 19.2326758 21.3358816 23.268609 25.6432999 28.7349613 29.973039 33.2516557 35.3355728 41.3036155 42.878786 42.878786 47.2121739 50.9984602 54.4372936 56.6192145 61.5811791	11.8075874 12.8785044 14.5733827 16.1513958 18.113896 20.7029764 21.749405 24.5440047 26.336333 28.2140781 31.5284116 40.1132721 49.6449153 55.4760202 37 18.5858125 19.960232 22.1056272 24.0749426 26.4920943 29.6354694 42.3833057 43.98458 42.3833057 43.98458 42.3833057 43.984848 42.3833057 43.98458 42.9833355	12.4613359 13.5647098 15.3078606 16.927875 18.9392424 21.5877963 22.6571557 25.5092507 27.3362292 29.2486184 32.6204941 34.0265651 37.9159225 44.4507918 48.2782358 50.9933763 56.8922854 38 19.2889116 20.6914421 22.8784823 38.19.2889136 36.393937 37.34295 30.5373397 31.8145653 35.1920126 37.3354527 39.564339 43.461907 45.0762782 43.461907 45.9762789 53.3835406 56.89952205 61.1620868 64.1814124	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436 22.475022 23.5665861 26.4751348 30.282536 33.7109086 35.1993618 39.0874698 42.5569678 45.7222858 49.5878845 52.3356178 58.3011735 39 19.9958679 21.4261631 23.6543246 25.6953904 28.1957852 31.4405178 32.7369256 36.1627952 38.3353974 46.5394591 44.5394627 46.1730347 56.6959705 54.5722278 58.1200597 62.428121 65.4755709	13.7867199 14.9534565 16.7907723 18.492661 20.5992346 24.4776077 27.4416221 29.336641146 24.4776077 27.4416221 34.7997425 36.2501863 40.2560237 43.7729718 40.2560237 43.7729718 59.7030643  40 20.7065353 22.1642613 24.4330392 29.0505229 32.3449526 26.5093032 29.9055229 32.349526 41.622192 45.6160136 47.2685377 47.1339595 59.3417071 55.7584793 59.3417071 56.56907398 66.7659618
0.5% 1.0% 2.5% 5.0% 10.0% 20.0% 20.0% 20.0% 20.0% 50.0% 60.0% 75.0% 80.0% 90.0% 95.5% 99.5% 99.5% 10.0% 2.55% 6.0% 60.0% 75.0% 60.0% 75.0% 60.0% 75.0% 90.0% 90.0% 90.0% 90.0%	8.03365342 8.89719794 10.2828978 11.5913052 13.239598 15.4446084 16.3443838 18.7683091 20.3372276 24.934777 26.17710999 29.6150894 32.6705733 35.4788759 36.4788759 36.4788759 14.4577674 15.65554564 17.5387386 19.2805686 21.4335645 24.2550564 25.3901393 28.4086825 24.243554564 25.3901393 28.4086825 30.3359425 32.3486299 35.8870759 41.4217358 44.9353433 44.82318865 52.1913948	8.6427164 9.54249234 10.9823207 12.3380146 14.0414932 16.3140398 17.2396194 19.728791 21.3370448 23.0306609 26.039265 27.301454 40.2893604 42.795655 48.2679423 32 15.1340321 16.3622155 18.2907649 20.0719135 22.2705945 22.2705945 25.1477851 26.3041066 29.3762873 33.3808633 36.9729821 38.4663324 42.5847451 46.1942595 49.4804377 53.4857718	9.26042478 10.1957156 11.6885519 13.0905142 14.8479558 17.186509 18.1372967 20.6902042 22.3368784 27.141336 28.4287925 32.0068997 35.1724616 38.0756273 14.6383981 44.1812752 49.7282325 33 15.8152744 17.0735137 19.0466615 20.866534 23.1101967 26.0422156 27.2194412 30.3444103 30.3357809 34.4125885 38.057529 47.3998839 39.57179 43.7451796 47.3998839 50.7250801 54.7755398	9.8862335 10.8563615 12.4011502 13.848425 15.6586841 18.0618043 19.0372525 21.6524856 23.3367263 28.24115 29.5533152 28.24115 29.5533152 33.962443 36.4150285 39.364077 42.9798201 45.5585119 51.1785978 34 16.5012725 17.7891469 19.8062529 21.6642807 23.9522533 26.9382694 28.1360797 31.3130273 32.5126438288 39.140779 43.54438288 39.140779 40.6756494 44.9031575 48.6023674 51.9655992 56.0609087	10.5196521 11.5239754 13.11972 14.6114076 16.473408 19.3937645 19.3933409 22.6155789 24.3365867 26.142984 29.3388503 30.6752009 34.381587 37.6524841 40.6464691 44.3141094 46.9278902 52.6196558 17.1918203 18.5089262 20.5693766 22.4450152 24.7966548 27.8358737 29.0539637 32.282116 40.2227899 41.7779633 46.0587884 49.8018496 53.2033485 57.3420734	11.1602374 12.1981469 13.843905 15.3791566 17.291885 17.291885 17.291885 17.291885 17.3791566 17.291885 17.3791566 17.291885 17.1788796 30.4345654 31.7946101 36.5651713 38.8851387 41.9231701 46.6416827 48.2898823 54.0519624  17.8867265 17.3358816 23.268609 28.7349613 29.973039 33.2516557 28.37356728 37.5049393 41.3036155 42.8787986 47.2121739 50.9984602 54.4372996 58.6192145	11.8075874 12.8785044 14.5733827 16.1513958 18.113896 20.7029764 21.749405 24.5440047 26.3363393 31.5284116 32.9116877 40.1132721 43.194511 46.9629421 49.6449153 55.4760202 37 18.5858125 19.960232 22.1056272 24.0749426 26.4920943 29.6354694 30.8932552 34.2216272 24.0749426 42.3833057 43.9782175 48.3634084 52.1923197 55.6679733 59.8925	12.4613359 13.5647098 15.3078606 16.927875 18.9392424 21.587993 22.6571557 25.5092507 27.3362292 2486184 32.6204941 34.0265651 37.9159225 41.3371382 44.4607918 38 19.2889116 20.6914421 22.8784823 24.8839044 27.34295 30.5373397 31.8145653 35.1920126 37.3354527 39.5643492 43.461907 45.0762782 49.5125798 53.3835406 56.8955205 61.1620868	13.1211489 14.2564546 16.0470717 17.7083662 19.7677436 22.475052 23.5665861 26.4751344 28.3361269 30.282536 33.7109086 35.13336118 39.0874698 42.5569678 45.7222868 49.5878845 52.3356178 58.3011735 39 19.9958679 21.4261631 23.6543246 25.6953904 28.1957852 31.4405178 32.7369256 36.1627952 36.1627952 36.1627952 46.1730347 50.6597705 54.5722278 58.1200597 62.428121	13.7867199 14.9534565 16.7907723 18.492661 20.5992346 23.3641146 24.4776077 27.4416221 29.3360315 31.3158632 34.7997425 36.2501868 40.2560237 43.7729718 46.9792425 35.6719619 59.7030643  40 20.70655353 22.1642613 24.4330392 26.5093032 26.5093032 27.349526 33.6602949 37.1339595 37.63353448 41.6221929 45.6160136 47.2685377 51.8050572 55.7584793 59.3417071 63.6907398

**Tab. A.14** Quantile  $F_{m,n}(p)$  der F-Verteilung

### A.5 Quantile der F-Verteilung

Bitte denken Sie daran, dass Sie die Tabellen nur für  $p=95\,\%$  bzw.  $p=99\,\%$  anwenden dürfen, und erinnern Sie sich ggf. an die Umrechnungsformel in Abschn. 18.2.

	100	3.93614299	3.08729589	2.69553425	2.46261493	2.30531824	2.19060094	2.10251329	2.03232759	1.9748292	1.92669249	1.76753006	1.67643425	1.57330235	1.51512527	1.47723132	1.39171955			100	6.89530103	4.82390981	3.98369531	3.51268406	3.20587177	2.9876845	2.82329532	2.69426273	2.5898406	2.50331113	2.22301469	2.0666461	1.89325403	1.79718143	1.73529179	1.59766912	
		⊢	$\perp$	_		_	-	_	$\perp$		$\perp$		$\perp$		_	_	ш								-						$\vdash$				$\vdash$		
	90	4.03430971	3.18260985	2.79000841	2.55717915	2.40040913	2.2864359	2.19920209	2.12992276	2.07335116	2.02614296	1.87138398	1.78412482	1.68715693	1.63368179	1.59949547	1.52491118		88	90	7.1705768	5.05661087	4.19934345	3.71954519	3.40767951	3.18643421	3.02016829	2.89000772	2.78495568	2.69813941	2.41896141	2.2652428	2.09759344	2.00659151	1.94896422	1.82475324	
	40	4.08474573	3.23172699	2.8387454	2.60597495	2.44946643	2.3358524	2.24902433	2.18017045	2.12402926	2.07724805	1.92446282	1.83885935	1.74443196	1.69279721	1.66000315	1.5892242			40	7.31409993	5.17850824	4.31256921	3.82829355	3.51383983	3.29101239	3.12375706	2.99298087	2.88756044	2.80054511	2.52161569	2.36887612	2.20338205	2.11423245	2.05811339	1.93834073	
	30	4.17087679	3.3158295	2.92227719	2.68962757	2.53355455	2.42052319	2.33434396	2.26616327	2.21069698	2.16457992	2.01480369	1.93165348	1.84087169	1.79179012	1.76087918	1.69503716		2000000	30	7.56247609	5.39034586	4.50973956	4.01787684	3.69901881	3.47347661	3.30449889	3.17262396	3.06651591	2.97909356	2.70018034	2.54865918	2.38596735	2.29921107	2.24501192	2.13070998	
	20	4.3512435	3.49282848	3.09839121	2.8660814	2.71088984	2.59897771	2.51401106	2.44706375	2.39281411	2.34787757	2.20327429	2.12415521	2.0390859	1.9938191	1.96562794	1.90655442		8.5	20	8.09595806	5.84893192	4.93819338	4.43069016	4.10268463	3.87142682	3.69874015	3.56441205	3.45667563	3.36818639	3.08804071	2.93773528	2.7784849	2.69474863	2.64295447 2.24501192	2.53531261	
	15	4.54307717	3.68232034	3.2873821	3.05556828	2.90129454	2.790465	2.70662678	2.64079688	2.58762644	2.54371855	2.40344707	2.32753501	2.24678916	2.20427568	2.17798544	2.12342845			15	8.68311682		5.41696486	4.89320959	4.55561398	4.31827305		4.00445319		3.80493975	3.52219368	3.37189158	3.21411018	3.13190557	3.08137147	2.97724156	
	10	4.96460274	4.10282102	3.70826482	3.47804969	3.32583453	3.21717455	3.1354648	3.07165839	3.02038295	2.97823702	2.84501653	2.7740164	2.69955123	2.66085521	2.637124	2.58841218			10	10.0442893	7.55943216 6.35887348	6.55231256	5.99433866	5.63632619	5.38581104		5.05669313		4.8491468	4.5581396	4.40539477	4.24693282	4.1652869	4.11545174	4.01371942	
	6	5.11735503	4.25649473	3.86254836	3.63308851	3.48165865	3.37375365	3.29274584	3.22958261	3.1788931	3.13728011	3.00610197	2.93645539	2.86365234	2.82593265	2.80284252	2.75555668		- 53	6	10.561431	8.02151731	6.99191722	6.42208546	6.05694071	5.80177031		5.46712252		5.25654199	4.96207836	4.80799523	4.64858167	4.56664872	4.51671488	4.41497995	
	89	5.31765507	4.45897011	4.06618055	3.83785335	3.68749867	3.58058032	3.50046386	3.43810123	3.38813023	3.34716312	3.21840551	3.15032377		3.04277782	3.02039779	2.97467449			80	11.2586241		7.59099195	7.00607662	6.63182516	6.37068073		6.02887011	5.91061885	5.81429386	5.51512484	5.35909494	5.19812955	5.1156104 4.56664872	5.06539774	4.96329583	
	7	5.59144785	4.73741413	4.3468314	4.12031173	3.97152315	3.86596885	3.78704354	3.72572532	3.6766747	3.63652312	3.51074018	3.44452483	3.3758075 3.07940647	3.34042965	3.31885564	3.27488466			7	12.2463833	9.54657802	8.45128505	7.84664506	7.46043549	7.19140479		6.84004907		6.62006267	6.31433088	6.15543839	5.99201017	5.90844856	5.85768204	5.7546573	
	9	5.98737761	5.14325285	4.75706266	4.53367695	4.38737419	4.28386571	4.20665849	4.14680416	4.09901554	4.05996279	3.93805799	3.87418858	3.80816427	3.77428628	3.75366766	3.71174536		8	9	13.7450225	10.9247665 9.54657802 8.64911064	9.77953824	9.14830103	8.74589526	8.46612534	_	8.10165137		7.87411853	7.55899442	7.39583189	7.22853306	7.1432219	7.09147513	6.98666691	
	5	6.60789097	5.78613504	5.40945132	5.19216777	5.05032906	4.95028807	4.8758717	4.81831954	4.77246561	4.73506307	4.61875912	4.5581315	4.49571226	4.46379332	4.44440562	4.40508082			9	16.258177	13.2739336	12.0599537	11.3919281	10.9670207	10.6722548	_	10.289311		10.0510172	9.72221947	9.55264616	9.37932921	9.29118878	9.23781079	9.12990713	
	4	7.70864742	6.94427191	6.59138212	6.38823291	6.2560565	6.16313228	6.09421093	6.04104448	5.99877903	5.96437055	5.85780536	5.80254189	5.74587698	5.71699841	5.6994915	5.66406407		83	4	21.1976896	18	16.6943692	15.9770249	15.5218575	15.2068649		14.7988888	14.6591336	14.5459008	14.1982019	14.0196087	13.8376603	13.7453789	13.6895798	13.5769915	
	3	10.1279645	9.5520945	9.27662815	9.11718225	9.01345517	8.94064512	8.88674296	8.84523846	8.81229956	8.78552471	8.70287013	8.6601898	8.61657587	8.59441125	8.58099627	8.55390171			3	34.1162216	30.8165204		28.7098984	28.2370808	27.9106574		27.489177	063	27.2287341	26.872195	26.6897905	26.5045337	26.4108127	26.3542251	26.2402417	
	2	18.5128205	19	19.1642921	19.2467943	19.2964097	19.329534	19.3532175	19.3709929	19.3848257	19.3958967	19.4291351	19.4457685	19.4624114	19.4707364	19.4757326	19.4857275		2)	2	98.5025126	66	99.1662014 29.4566951	99.2493719	99.2992965	99.3325889		99.3742148	_	99.399196	99.4325107	99.4491708	99.4658329	99.4741646	99.4791638	99.4891628	(d-1) m (1-b)
	-	161,447639	199.5	215.707345	224.583241	230.161878	233.986	236.7684	238.882695	240.543255	241.881747	245.949926	248.013082	250.095148	251.143153	251,774158	253.041071			-	4052.1807	4999.5	5403.35201	5624.58333	5763.64955	5858.98611		5981.07031	-	6055.84671	6157.28462	6208.73022	6260.64858	6286.78205	6302.51719	6334.11004	$F_{m,n}(p) = 1/F_{n,m}(1-p)$
6 = 62	u /	-	2		4 2	5 2	9	7	8 2	9 2	10 2	15 2	20 2	30 2	40 2	50 2	100 2	b = 88%	<i>u</i> /	/	-	2	3 5	4 5	9 9	9	7 6	8 8	9 6	10 6	15 6	20 6	30 6	40 6	9 09	100	F