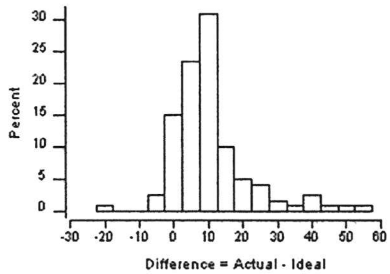
SHOW ALL WORK Keep three decimal places in most calculations.

1. [30] Circle the correct answer.

a. Which one of these statistics is unaffected by outliers?

1. Mean 2. Standard deviation 3. Median 4. Range

b. The following histogram shows the distribution of the difference between the actual and "ideal" weights for 119 female students.



What is the approximate shape of the distribution?

1. Nearly symmetric 2. Skewed to the left 3. Skewed to the right 4. Bimodal (has more than one peak)

c. Suppose $P(A) = 0.55$ and $P(B) = 0.25$. What is $P(A \cup B)$ if A and B are independent?

1. 0.8000 2. 0.4000 3. 0.6625 4. 0.1375

d. Suppose two 6-sided dice are rolled. What is the probability that the sum of the two die is equal to 10?

1. $^1/_9$ 2. $^1/_{12}$ 3. $^5/_{36}$ 4. $^3/_{18}$

e. Take a simple random sample of size 25 from a normal distribution: $N(\mu = 4, \sigma = 5)$. The distribution of the sample mean $\overline{X}$ is

1. $N(\mu = 4,\ \sigma = 5)$ 2. $N(\mu = 4,\ \sigma = 1)$ 3. $N(\mu = 10,\ \sigma = 5)$ 4 $N(\mu = 0,\ \sigma = 1)$

f. Let A be the event that a selected householder is prosperous and let B be the event that a selected householder is educated. The Census Bureau says that P (A) = 0.27, P (B) = 0.72, and P (A or B) = 0.65 Find P (A and B), the probability that a randomly selected householder is both prosperous and educated.

1. 0.99 2. 0.01 3. 0.34 4. 0.35

g. Determine whether the underlined value is a parameter or a statistic

Only 15 men have walked on the moon. The average time these men spent on the moon was <u>41.82 hours</u>.

1. Parameter 2. Statistic

h. How large a sample size n would you need to estimate population proportion p with margin of error 0.04 with 95 % confidence? Assume that you don't know anything about the value of p.

1. 125 2. 1200 3. 601 4. 16

i. A salesperson contacts prospective customers by telephone and estimates that 35% of all telephone calls results in a sale. The salesperson makes 10 telephone calls. Find the probability that at least 1 of the 10 telephone calls result in a sale.

a. 0.1757 2. 0.0135 3. 0.9865 4. 0.5050

j. Explain why the following statement is wrong.

"We found a high correlation (r = 1.19) between students' ratings of faculty teaching and ratings made by other faculty members."

Answer: ____

2. [15] Below is a list of the state income tax paid by a TA from 1993 to 1997.

141 126 203 225 175

a. Find the sample mean and median of these numbers.

b. Find the standard deviation s of these numbers

3. [15] The numbers below are revenue (in millions) from the top ten Pixar animated movies as of June 2010.

192 163 246 256 340 261 244 206 224 293

a. Find Q1 and Q3. SHOW WORK.

b. Draw a box plot for the movie data.

```
---------------------------------
 |     |     |     |     |     |     |
160   190   220   250   280   310   340
```

4. [9] The lengths of reign of 13 rulers of England and Great Britain are listed below.

21 13 35 19 35 10 17 56 35 20 50 22 13

Make a stem plot for the data.

5. [15] The length of human pregnancies (Gestation Period) is approximately normally distributed with mean $\mu = 266$ days and standard deviation $\sigma = 16$ days.

   a. What proportion of pregnancies lasts more than 270 days?

   b. What proportion of pregnancies lasts between 240 and 280 days?

   c. What is the probability that a random sample of 50 pregnancies has a mean gestation period of 260 days or less?

6. [10] Suppose X has binomial distribution $Bin\ (100, 0.4)$. Answer the questions below.

   a) Find the mean and standard deviation of X.

   b) Using the normal approximation, find$P(45 < X < 65)$.

7. [12] Suppose it is desired to predict the weight of the human brain (y) from a measurement of head size (x). The correlation r = 0.6719

variable	mean	standard deviation
brain weight	1263.2	164.5
head size	15.174	0.8862

a. Find the slope (b) of the least squares line.

b. Find the intercept (a) of the least squares line.

c. Write the equation of the least-square regression line.

8. [12] MATH 282 Grades are below in the table:

	Grade					
Section	**A**	**B**	**C**	**D**	**F**	**Row Total**
M	11	8	3	1	2	25
Other	19	41	40	1	37	138
Col.Total	30	49	43	2	39	163

a. Find the probability that a randomly selected student got an A.

b. Find the probability that randomly selected student got an A given that the student was in was in sec. M.

c. Find the probability that a randomly selected student got a D or F.

9. [15] A simple random sample of 30 Chancellor's Scholarship recipients at SIU yields an average ACT score $\bar{x}$ = 33 and sample standard deviation s =3. Answer the questions below and make a 95% confidence interval for μ, which is the mean ACT score of all Chancellor's Scholarship recipients at SIU.

a. To make the confidence interval, do you use a T-procedure or a Z- procedure?

b. Calculate the margin of error.

c. Make a 95% confidence interval for μ.

10. [15] A survey of 2306 adult Americans aged 18 and older conducted by Harris Interactive found that 417 have donated blood in the past two years.

a. Obtain a point estimate for the population proportion of adult Americans aged 18 and older who have donated blood in the past two years.

b. Construct 90% confidence interval for the population proportion of adult Americans who have donated blood in the past two years

11. [12] To test H_0: μ = 80 vs H_a: μ < 80, a simple random sample of size 22 is obtained from a population that is known to be normally distributed. It is given that $\overline{x}$= 76.9 and s = 8.5. Test this hypothesis at the α = 0.02 level of significance.

Step 1: Test statistic:

Step 2: P-value:

Step 3: Conclusion:

12. [15] Among a simple random sample of 500 of students who have taken the ACT, 219 are prepared for college mathematics. Does this represent significant evidence that less than half of the students who have taken the ACT are prepared for college mathematics upon graduation from high school? Use the α = 0.05 level of significance. Assume the distribution of $\hat{p}$ is approximately normal.

Step 1: Identify the hypothesis:

Step 3: Test statistic:

Step 4: P-value:

Step 5: Conclusion:

13. [15] Both Walmart and Kmart sell a helicopter toy for 10-year-olds. To compare prices between the two retail chains, independent random samples are taken from each. The following data are obtained.

	Sample size	Sample mean	Sample SD
Walmart	$n_1 = 25$	$\bar{x}_1 = 84$	$s_1 = 12$
Kmart	$n_2 = 20$	$\bar{x}_2 = 75$	$s_2 = 8$

Let μ_1= Walmart population mean price of the toy, and μ_2= = Kmart population mean price of the toy.

Is there a difference between the population mean prices of the toys at Walmart and K-mart? Given $\alpha =$ 0.05, answer the above question by solving the following:

a. State the hypotheses.

b. Calculate the test statistic.

c. Find the p-value of the test statistic.

d. What is your conclusion?

14. [20]

		boys	girls	total
make good grades	observed	96	295	391
	expected	(144.189)	(246.811)	
	cell chisq	[16.105]	[9.409]	
be popular	observed	32	45	77
	expected	(28.395)	( )	
	cell chisq	[0.458]	[ ]	
be good in sports	observed	94	40	134
	expected	(49.415)	(84.584)	
	cell chisq	[ ]	[23.501]	
total		222	380	602

The table above is a SRS of 222 boys and a SRS of 380 girls from grades 4, 5, and 6. They were asked which is most important, making good grades, being popular, or being good in sports. It is desired to test whether gender and most important goal are related. So 96 boys want to make good grades. The second entry is in parentheses and is the expected count. So if H_0 is true, one would expect that about 247 girls would want to make good grades.

a. Find the value of the expected count that is not given in the table. Find the 2 cell chi square contributions that need to be computed. Show work.

b. Do a 4-step of hypotheses. Show how the appropriate table is used.

Formula Sheet:

* Standard deviation:

$$s_x = \sqrt{\frac{1}{n-1}\sum(x_i - \bar{x})^2}$$

* Regression:

$$b = r\,\frac{s_y}{s_x}$$

$$a = \bar{y} - b\bar{x}$$

* Binomial probability:

$$P(X = k) = \binom{n}{k}\,p^k\,(1-p)^{n-k}$$

$\mu_X = np$ and $\sigma_X = \sqrt{np(1-p)}$

* CLT

$$\bar{X} \sim N(\mu, \frac{\sigma}{\sqrt{n}})$$

* Confidence interval for μ:

$$\bar{x} \pm t^* \frac{s_x}{\sqrt{n}}$$

$$df = n - 1$$

* Confidence interval for P:

$$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

* Confidence interval for $\mu_1 - \mu_2$:

$$(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

$$df = \min(n_1 - 1, n_2 - 1)$$

* Confidence interval for $P_1 - P_2$:

$$(\hat{p}_1 - \hat{p}_2) \pm z^* \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$

* One-sample test statistic for mean:

$$t = \frac{\bar{x} - \mu}{s_x/\sqrt{n}}$$

$$df = n - 1$$

* One-sample test statistic for Proportion:

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$

* Two-sample test statistic for compare means:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$df = \min(n_1 - 1, n_2 - 1)$$

* Two-sample test statistic for compare proportions:

$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}(1-\hat{p})(\frac{1}{n_1} + \frac{1}{n_2})}} \qquad \hat{p} = \text{pooled proportion}$$

*Sample size:

$$n = \left(\frac{z^*\sigma}{m}\right)^2$$

$$n = \left(\frac{z^*}{m}\right)^2 p^*(1-p^*)$$

*Chi-square testing:

$$Exp. = \frac{(row\ total).(column\ total)}{overall\ total}$$

$$X^2 = \sum \frac{(Obs. - Exp.)^2}{Exp.}$$

$$df = (r-1)(c-1)$$

* Level of confidence and critical values:

Level of Confidence, $(1-\alpha)\cdot 100\%$	Area in Each tail, $\frac{\alpha}{2}$	Critical Value, $z_{\frac{\alpha}{2}}$
90%	0.05	1.645
95%	0.025	1.96
99%	0.005	2.575

Table entry for z is the area under the standard Normal curve to the left of z.

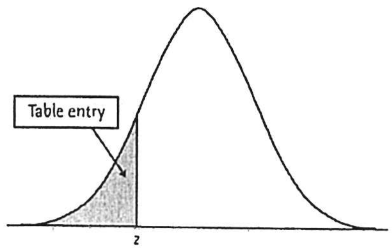


TABLE A Standard Normal cumulative proportions

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
−3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
−3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
−2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
−2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
−2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
−2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
−2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
−2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
−2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
−2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
−2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
−2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
−1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
−1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
−1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
−1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
−1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
−1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
−1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
−1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
−1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
−1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
−0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
−0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
−0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
−0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
−0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
−0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
−0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
−0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
−0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
−0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641

Table entry for z is the area under the standard Normal curve to the left of z.

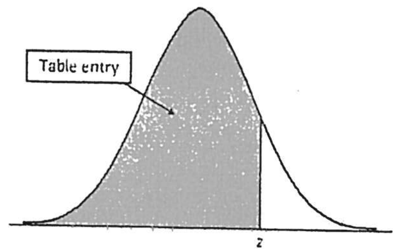


TABLE A Standard Normal cumulative proportions (*continued*)

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

Table entry for C is the critical value t^* required for confidence level C. To approximate one- and two-sided P-values, compare the value of the t statistic with the critical values of t^* that match the P-values given at the bottom of the table.

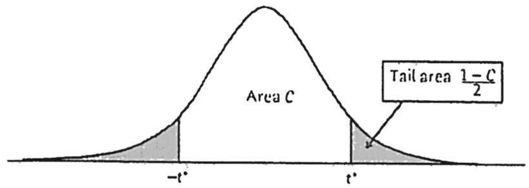


TABLE C *t* **distribution critical values**

DEGREES OF FREEDOM	CONFIDENCE LEVEL *C* 50%	60%	70%	80%	90%	95%	96%	98%	99%	99.5%	99.8%	99.9%
1	1.000	1.376	1.963	3.078	6.314	12.71	15.89	31.82	63.66	127.3	318.3	636.6
2	0.816	1.061	1.386	1.886	2.920	4.303	4.849	6.965	9.925	14.09	22.33	31.60
3	0.765	0.978	1.250	1.638	2.353	3.182	3.482	4.541	5.841	7.453	10.21	12.92
4	0.741	0.941	1.190	1.533	2.132	2.776	2.999	3.747	4.604	5.598	7.173	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	2.757	3.365	4.032	4.773	5.893	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	2.612	3.143	3.707	4.317	5.208	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.517	2.998	3.499	4.029	4.785	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.449	2.896	3.355	3.833	4.501	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.398	2.821	3.250	3.690	4.297	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.359	2.764	3.169	3.581	4.144	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.328	2.718	3.106	3.497	4.025	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.303	2.681	3.055	3.428	3.930	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.282	2.650	3.012	3.372	3.852	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.264	2.624	2.977	3.326	3.787	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.249	2.602	2.947	3.286	3.733	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.235	2.583	2.921	3.252	3.686	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.224	2.567	2.898	3.222	3.646	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.214	2.552	2.878	3.197	3.611	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.205	2.539	2.861	3.174	3.579	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.197	2.528	2.845	3.153	3.552	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.189	2.518	2.831	3.135	3.527	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.183	2.508	2.819	3.119	3.505	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.177	2.500	2.807	3.104	3.485	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.172	2.492	2.797	3.091	3.467	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.167	2.485	2.787	3.078	3.450	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.162	2.479	2.779	3.067	3.435	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.158	2.473	2.771	3.057	3.421	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.154	2.467	2.763	3.047	3.408	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.150	2.462	2.756	3.038	3.396	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.147	2.457	2.750	3.030	3.385	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.123	2.423	2.704	2.971	3.307	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.109	2.403	2.678	2.937	3.261	3.496
60	0.679	0.848	1.045	1.296	1.671	2.000	2.099	2.390	2.660	2.915	3.232	3.460
80	0.678	0.846	1.043	1.292	1.664	1.990	2.088	2.374	2.639	2.887	3.195	3.416
100	0.677	0.845	1.042	1.290	1.660	1.984	2.081	2.364	2.626	2.871	3.174	3.390
1000	0.675	0.842	1.037	1.282	1.646	1.962	2.056	2.330	2.581	2.813	3.098	3.300
z^*	0.674	0.841	1.036	1.282	1.645	1.960	2.054	2.326	2.576	2.807	3.091	3.291
One-sided P	.25	.20	.15	.10	.05	.025	.02	.01	.005	.0025	.001	.0005
Two-sided P	.50	.40	.30	.20	.10	.05	.04	.02	.01	.005	.002	.001

Table entry for p is the critical value χ^* with probability p lying to its right.

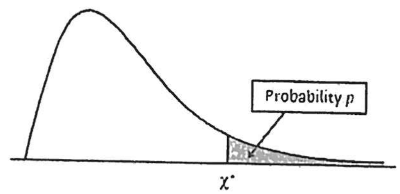


TABLE D Chi-square distribution critical values

df	.25	.20	.15	.10	.05	.025	.02	.01	.005	.0025	.001	.0005
							p					
1	1.32	1.64	2.07	2.71	3.84	5.02	5.41	6.63	7.88	9.14	10.83	12.12
2	2.77	3.22	3.79	4.61	5.99	7.38	7.82	9.21	10.60	11.98	13.82	15.20
3	4.11	4.64	5.32	6.25	7.81	9.35	9.84	11.34	12.84	14.32	16.27	17.73
4	5.39	5.99	6.74	7.78	9.49	11.14	11.67	13.28	14.86	16.42	18.47	20.00
5	6.63	7.29	8.12	9.24	11.07	12.83	13.39	15.09	16.75	18.39	20.51	22.11
6	7.84	8.56	9.45	10.64	12.59	14.45	15.03	16.81	18.55	20.25	22.46	24.10
7	9.04	9.80	10.75	12.02	14.07	16.01	16.62	18.48	20.28	22.04	24.32	26.02
8	10.22	11.03	12.03	13.36	15.51	17.53	18.17	20.09	21.95	23.77	26.12	27.87
9	11.39	12.24	13.29	14.68	16.92	19.02	19.68	21.67	23.59	25.46	27.88	29.67
10	12.55	13.44	14.53	15.99	18.31	20.48	21.16	23.21	25.19	27.11	29.59	31.42
11	13.70	14.63	15.77	17.28	19.68	21.92	22.62	24.72	26.76	28.73	31.26	33.14
12	14.85	15.81	16.99	18.55	21.03	23.34	24.05	26.22	28.30	30.32	32.91	34.82
13	15.98	16.98	18.20	19.81	22.36	24.74	25.47	27.69	29.82	31.88	34.53	36.48
14	17.12	18.15	19.41	21.06	23.68	26.12	26.87	29.14	31.32	33.43	36.12	38.11
15	18.25	19.31	20.60	22.31	25.00	27.49	28.26	30.58	32.80	34.95	37.70	39.72
16	19.37	20.47	21.79	23.54	26.30	28.85	29.63	32.00	34.27	36.46	39.25	41.31
17	20.49	21.61	22.98	24.77	27.59	30.19	31.00	33.41	35.72	37.95	40.79	42.88
18	21.60	22.76	24.16	25.99	28.87	31.53	32.35	34.81	37.16	39.42	42.31	44.43
19	22.72	23.90	25.33	27.20	30.14	32.85	33.69	36.19	38.58	40.88	43.82	45.97
20	23.83	25.04	26.50	28.41	31.41	34.17	35.02	37.57	40.00	42.34	45.31	47.50
21	24.93	26.17	27.66	29.62	32.67	35.48	36.34	38.93	41.40	43.78	46.80	49.01
22	26.04	27.30	28.82	30.81	33.92	36.78	37.66	40.29	42.80	45.20	48.27	50.51
23	27.14	28.43	29.98	32.01	35.17	38.08	38.97	41.64	44.18	46.62	49.73	52.00
24	28.24	29.55	31.13	33.20	36.42	39.36	40.27	42.98	45.56	48.03	51.18	53.48
25	29.34	30.68	32.28	34.38	37.65	40.65	41.57	44.31	46.93	49.44	52.62	54.95
26	30.43	31.79	33.43	35.56	38.89	41.92	42.86	45.64	48.29	50.83	54.05	56.41
27	31.53	32.91	34.57	36.74	40.11	43.19	44.14	46.96	49.64	52.22	55.48	57.86
28	32.62	34.03	35.71	37.92	41.34	44.46	45.42	48.28	50.99	53.59	56.89	59.30
29	33.71	35.14	36.85	39.09	42.56	45.72	46.69	49.59	52.34	54.97	58.30	60.73
30	34.80	36.25	37.99	40.26	43.77	46.98	47.96	50.89	53.67	56.33	59.70	62.16
40	45.62	47.27	49.24	51.81	55.76	59.34	60.44	63.69	66.77	69.70	73.40	76.09
50	56.33	58.16	60.35	63.17	67.50	71.42	72.61	76.15	79.49	82.66	86.66	89.56
60	66.98	68.97	71.34	74.40	79.08	83.30	84.58	88.38	91.95	95.34	99.61	102.7
80	88.13	90.41	93.11	96.58	101.9	106.6	108.1	112.3	116.3	120.1	124.8	128.3
100	109.1	111.7	114.7	118.5	124.3	129.6	131.1	135.8	140.2	144.3	149.4	153.2