

Practice Problem Solutions

The solutions to problems 1 through 4 are found in the following table.

		Should psychologists prescribe drugs?		Row Total
		Yes	No	
Psychologists	A	$f_o = 125$	$f_o = 25$	150
		$f_e = 87.5$	$f_e = 62.5$	
Medical Doctors	C	$f_o = 50$	$f_o = 100$	150
		$f_e = 87.5$	$f_e = 62.5$	
Column Total		175	125	Grand Total = 300

$$5. \quad X^2 = \frac{(125 - 87.5)^2}{87.5} + \frac{(25 - 62.5)^2}{62.5} + \frac{(50 - 87.5)^2}{87.5} + \frac{(100 - 62.5)^2}{62.5}$$

$$X^2 = 16.071 + 22.5 + 16.071 + 22.5 = 77.142$$

$$6. \quad df = (2 - 1) \cdot (2 - 1) = 1$$

7. Critical value = 3.841. Reject the null hypothesis, the computed value is significant.

8. The results indicate that medical doctors and psychologists have significantly different opinions about granting psychologists the right to prescribe psychoactive drugs.

Answers 9-12 are found in the following table.

Grad Students	Believe in ESP?			Row Total
	Yes	No	Maybe	
Psych.	$f_o = 11$ $f_e = 25.97$	$f_o = 25$ $f_e = 8.59$	$f_o = 5$ $f_e = 6.44$	41
Sciences	$f_o = 50$ $f_e = 44.35$	$f_o = 10$ $f_e = 14.66$	$f_o = 10$ $f_e = 10.99$	70
Human.	$f_o = 60$ $f_e = 50.68$	$f_o = 5$ $f_e = 16.75$	$f_o = 15$ $f_e = 12.57$	80
Column Total =	121	40	30	Grand Total = 191

13. $\chi^2 = 53.017$

14. $df = 4$

15. Critical value = 9.488. Reject the null hypothesis. The computed value of chi-square is significant. It seems graduate psychology students believe in ESP less than graduate students in the two other programs.

16.

X_1	Scary R_1	X_2	Musical R_2
45	7	32	2
67	16	38	5
69	17	33	3
56	12	49	9.5
73	18	44	6
56	12	60	14
63	15	48	8

84	19	36	4
49	9.5	23	1
56	12		
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	$\sum R_1 = 137.5$		$\sum R_2 = 52.5$

17. $\sum R_1 = 137.5$

18. $\sum R_2 = 52.5$

19. $U_1 = (10 \cdot 9) + \frac{10 \cdot (10 + 1)}{2} - 137.5 = 7.5$

20. $U_2 = (9 \cdot 10) + \frac{9 \cdot (9 + 1)}{2} - 52.5 = 82.5$

21. $U = 7.5$

22. Critical value = 20

Yes, the computed U is significant.

23. Subjects eat more popcorn at scary movies than at musicals.

The answers to problems 24 - 27 are found in the following table.

Child	Verbal	Nonverbal	D	+R	-R
C. J.	3	6	-3		4.5
F. K.	5	8	-3		4.5
M. O.	7	9	-2		2.5
I. M.	4	8	-4		6
G. G.	2	4	-2		2.5
K. T.	1	1			
B. W.	4	3	+1	1	
M. B.	2	8	-6		7

$$\sum +R = 1 \quad \sum -R = 27$$

28. $T = 1$

29. $n = 7$

30. Critical value = 2 The computed value is significant.

The answers to problems 31 and 32 are shown in the following table.

Type of Tape

Audible		Subliminal		Control	
X_1	R_1	X_2	R_2	X_3	R_3
55	17	32	9.5	30	6.5
62	21	30	6.5	29	4.5
49	15	28	2.5	26	1
55	17	31	8	33	12
61	20	33	12	28	2.5
58	19	32	9.5	29	4.5
55	17	36	14	33	12
$\sum R_1 = 126$		$\sum R_2 = 62$		$\sum R_3 = 43$	

33. a) $n_1 = 7$, b) $n_2 = 7$, c) $n_3 = 7$, d) $N_T = 21$

34.
$$H = \left(\frac{12}{21 \cdot (21+1)} \right) \cdot \left(\frac{126^2}{7} + \frac{62^2}{7} + \frac{43^2}{7} \right) - (3 \cdot (21+1)) = 14.113$$

35. $df = 3 - 1 = 2$
 Critical value = 5.991
 Yes, this is significant.

36. There is a significant difference amongst the three different conditions on the memory test.