PIERIAN DATA

EXERCISE #7 – Chi-square Tests

1. An automobile manufacturer believes that, out of every 100 cars sold, on average
   25 are white, 20 are silver, 15 are black, and 40 are other colors like blue, red and green.
   To test their assumption, they gather data on 100 recent sales.
   Perform a chi-square test to determine if the observed sales match the manufacturer's
   expectations, with a 95% level of confidence.

Color	# Sold	Expected	$(O - E)$	$(O - E)^2$	$\dfrac{(O - E)^2}{E}$
white	19	25			
silver	31	20			
black	18	15			
other	32	40			
Sum:	100	100		Sum:	

$$\chi^2 = \sum \frac{(O - E)^2}{E} =$$

$\alpha = 0.05$

$df = 4 - 1 = 3$

$\chi^2_{critical} =$

Chi-square Critical Values						
df	0.15	0.10	0.05	0.01	0.005	0.001
1	2.072	2.706	3.841	6.635	7.879	10.828
2	3.794	4.605	5.991	9.210	10.597	13.816
3	5.317	6.251	7.815	11.345	12.838	16.266

What conclusion can be drawn?