7.17

G	O	R	P	Y	
18	9	15	13	11	← observed
13.2	13.2	13.2	13.2	13.2	← expected

H_0 : $p = \frac{1}{5} = 20\%$ vs. H_a i not H_0 (H_0 false)

for each color

$$\chi^2 = \sum_{\text{categories}} \frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

add over all categories

$\chi^2 = 3.7$

$df = 4$

$p =$

$$= \frac{(18-13.2)^2 + (9-13.2)^2 + (15-13.2)^2 + (13-13.2)^2 + (11-13.2)^2}{13.2}$$

$$= 3.7$$

#14

R	P	S	
66	39	14	← observed
39.67	39.67	39.67	← expected $\frac{119}{3} = 39.67$

$H_0: p = \frac{1}{3}$ for each category vs. H_a: not H_0

$df = 2$

$$\chi^2 = \frac{(66-39.67)^2 + (39-39.67)^2 + (14-39.67)^2}{39.67}$$

$$\chi^2 = 34.1 \Rightarrow p \approx 0$$