

CS5811 In class exercise - Working with joint probability distribution tables

Consider results of a hypothetical survey of high school students. The survey has with three questions:

- Location of the *School*: rural (r), suburban (s), urban (u)
- Most *Important* of these: grades (g), being popular (p), athletics (a)
- *Has* a pet: yes (y), no (n)

Answer				
S	I	H	Number	
r	g	y	30	r total = 149
r	g	n	27	
r	p	y	29	
r	p	n	21	
r	a	y	29	
r	a	n	13	
s	g	y	49	s total = 151
s	g	n	38	
s	p	y	30	
s	p	n	12	
s	a	y	18	
s	a	n	4	
u	g	y	20	u total = 178
u	g	n	83	
u	p	y	9	
u	p	n	40	
u	a	y	6	
u	a	n	20	
Total			478	

Compute the following probabilities or probability distributions

1. $P(r)$
2. $\mathbb{P}(S)$
3. $P(r,a,n)$
4. $P(r,a)$
5. $\mathbb{P}(r,a,H)$
6. $\mathbb{P}(r,I,H)$
7. $P(r \rightarrow p)$
8. $P(p \mid r)$
9. $\mathbb{P}(I \mid r)$