$$P(A_4 \mid R_3) = \frac{P(A_4 \text{ and } R_3)}{P(R_3)} = \frac{36/1164}{320/1164} = \frac{0.031}{0.275} = 0.1125$$

Age (yr)	Full professor R_1	Associate professor R_2	Assistant professor R_3	Instructor R_4	Total
Under 30 A_1	A1 and R1: 2	3	57	A1 and R4: 6	68
30–39 A_2	52	170	163	17	402
40–49 A_3	156	125	61	6	348
50–59 A_4	145	68	A4 and R3: 36	4	253
60 & over A_5	75	15	3	0	93
Total	430	381	320	33	1164

Rank

$P(R_3) = \frac{320}{1164}$

$P(A_2) = \frac{402}{1164}$

$P(A_2 \text{ and } R_2) = \frac{170}{1164}$

$\frac{36}{320}$

Cells

R3 = the event that an faculty's rank is Assistant Prof.

A2 = the event that the faculty's age is 30-39.

A2 and R2

	C1	C2	Total
R_1	3	$x=7$	10
R_2	$z=8$	7	$y=15$
Total	$a=11$	$b=14$	25

$3+x=10$

$x=7$

$10+y=25$

$y=15$

$z+7=15$

$z=8$

Joint probabilities (based on cells)

Marginal probabilities (based on totals)

$$P(R_2) = \frac{15}{25} = \frac{3}{5} = 0.6$$

$$P(C1) = \frac{11}{25}$$

$$P(R_1 \text{ and } C_1) = \frac{3}{25}$$