Conditional Probability

	Support	No Support	Totals
Dem	24	36	60
Rep	27	33	60
Totals	51	69	120

$$P(\text{support} \mid \text{Rep}) = \frac{27}{60} = \frac{9}{20}$$

Support + Rep

Rep

$$P(\text{Dem} \mid \text{No support}) = \frac{36}{69} = \frac{12}{23}$$

Dem + No Support

No Support

→ For any 2 events A + B, probability of B occurring, given that A has occurred is

$$P(B \mid A) = \frac{P(A \text{ and } B)}{P(A)} \quad , \; P(A) \neq 0$$

EX → Jar has 10 large red, 4 small red, 6 large blue, 5 small blue marbles

$$P(\text{large} \mid \text{red}) = \frac{\text{large red}}{\text{red}} = \frac{10}{14} = \frac{5}{7}$$

$$P(\text{large} \mid \text{blue}) = \frac{6}{11}$$

$$P(\text{blue} \mid \text{small}) = \frac{5}{9}$$

$$P(\text{blue} \mid \text{large}) = \frac{6}{16} = \frac{3}{8}$$

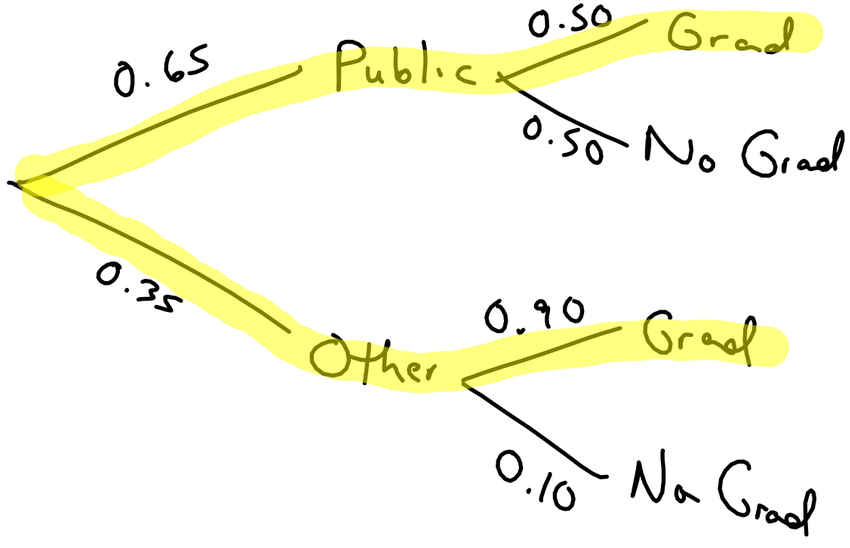
- Tree Chart

EX → State Tech reports graduation data

→ 65% attended public HS

→ 50% of Freshmen that attended public HS grad. w/in 5 yrs.

→ 90% other Freshmen grad. w/in 5 yrs.



What % of Freshmen grad w/in 5 yrs?

$(0.65)(0.50) + (0.35)(0.90)$

$0.325 + 0.315$

$0.64 \Rightarrow 64\%$

HW: p. 859 → 6-17
(10, 11 → tree diagram)