Conditional Probability

Conditional probability allows us to measure the combined probability of different events.
*To work out the probability of A happening **given that** B happens, use* $\frac{P(A \cap B)}{P(A)}$.

100 students were surveyed to find out if they were in top set for maths, and also to find out if they play a musical instrument.

15 out of the 20 in top set play an instrument. 40 people in total play an instrument.

1. Complete the table:

	Top maths set	**Not top maths set**
Plays an instrument		
Doesn't play an instrument		

2. What is the chance that **a student** chosen at random plays a musical instrument?
*Hint: use the number of instrument players **out of** all students.*

3. What is the probability that a **top set student** chosen at random plays an instrument?
*Hint: use the number of top set instrument players **out of** all top set students.*

4. What is the probability that **someone who plays an instrument** is in top set?
*Hint: use the number of top set instrument players **out of** all instrument players.*

Conditional Probability SOLUTIONS

Conditional probability allows us to measure the combined probability of different events. To work out the probability of A happening ***given that*** *B happens, use* $\frac{P(A \cap B)}{P(A)}$.

100 students were surveyed to find out if they were in top set for maths, and also to find out if they play a musical instrument.

15 out of the 20 in top set play an instrument. 40 people in total play an instrument.

1. Complete the table:

	Top maths set	**Not top maths set**
Plays an instrument	**15**	**45**
Doesn't play an instrument	**5**	**35**

2. What is the chance that **a student** chosen at random plays a musical instrument?
Hint: use the number of instrument players ***out of*** *all students.*

$$\frac{15+45}{100} = \frac{60}{100} = \mathbf{60\%}$$

3. What is the probability that a **top set student** chosen at random plays an instrument?
Hint: use the number of top set instrument players ***out of*** *all top set students.*

$$\frac{15}{15+5} = \frac{15}{20} = \frac{3}{4} = \mathbf{75\%}$$

4. What is the probability that **someone who plays an instrument** is in top set?
Hint: use the number of top set instrument players ***out of*** *all instrument players.*

$$\frac{15}{15+45} = \frac{15}{60} = \frac{1}{4} = \mathbf{25\%}$$

Note: the information in the table can also be represented as a tree diagram: