

GCSE 7+ Session 8 Solutions
Independent Practice
Probability

Revise, refresh, recall the core knowledge and skills:

- 1 In a sixth form, $\frac{3}{4}$ of the students study Maths and $\frac{2}{3}$ of the students study Physics. $\frac{1}{6}$ of the students study neither Physics nor Maths.
- Represent this information using a two-way table.
 - What fraction of the students study both Physics and Mathematics?
 - What is the probability that a randomly chosen Physics student studies Maths?

	MV	MX	
PV	$\frac{7}{12}$	$\frac{1}{12}$	$\frac{2}{3}$
PX	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{3}$
	$\frac{3}{4}$	$\frac{1}{4}$	1

b) $\frac{7}{12}$

c) $\frac{7}{12} \text{ out of } \frac{2}{3} = \frac{7}{12} \div \frac{2}{3}$
 $= \frac{7}{12} \times \frac{3}{2} = \frac{7}{8}$

- 2 Past experience tells me that

- I have soup for lunch with probability $\frac{2}{7}$
- I have both soup and salad for lunch with probability $\frac{1}{4}$
- I have salad for lunch with probability $\frac{3}{4}$

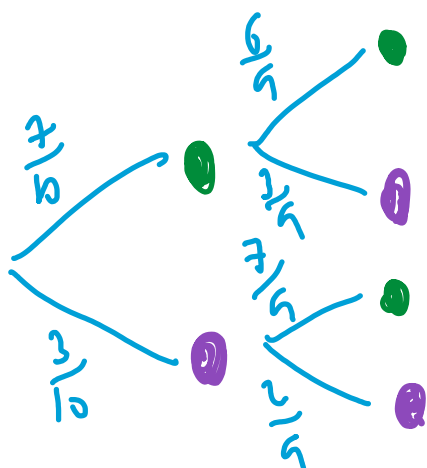
- Represent this information using a two-way table.
- What is the probability that I have neither soup nor salad?
- I will definitely have salad for lunch tomorrow. What is the probability that I will have it with soup?

	SpV	SpX	
SdV	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$
SdX	$\frac{1}{28}$	$\frac{3}{14}$	$\frac{1}{4}$
	$\frac{2}{7}$	$\frac{5}{7}$	1

b) $\frac{3}{14}$

c) $\frac{1}{4} \div \frac{3}{4} = \frac{1}{3}$

- 3 In a box of grapes there are 7 green grapes and 3 purple grapes. I take out a grape, eat it, then choose and eat another grape. Which is more likely: that I eat two grapes that are the same colour or two grapes that are different colours?



$$P(\text{same}) = \frac{42}{90} + \frac{6}{90} = \frac{48}{90}$$

$$P(\text{different}) = \frac{21}{90} + \frac{21}{90} = \frac{42}{90}$$

$\Rightarrow P(\text{same})$ is more likely

- 4 In a hurry, I take three pens at random from a box containing 3 red pens and 5 blue pens. What is the probability that at least one of the three pens is red?

imagine the tree...

$$P(\text{at least one red}) = 1 - P(\text{all blue})$$

$$= 1 - \frac{5}{8} \times \frac{4}{7} \times \frac{3}{6}$$

$$= 1 - \frac{5}{28}$$

$$= \frac{23}{28}$$

