

STIRLING TUITION  
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# Lesson 18

## Probability

Name: \_\_\_\_\_

Refer to for Explanation: Lesson 18 > Video 1 > **Calculating probability**

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1) Theo has 3 red sweets and 2 white sweets. He picks a sweet at random.

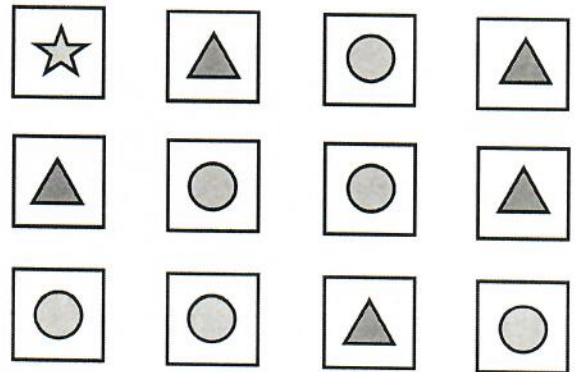
$$3 + 2 = \textcircled{5} = \text{Total}$$

(a) Write down the probability that Theo picks a red sweet.  $\frac{3}{5}$

(b) Write down the probability that Theo picks a white sweet.  $\frac{2}{5}$

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2) Jen has  $\textcircled{12}$  <sup>Total</sup> cards, each with a shape on it.  
She takes a card at random.



(a) What is the probability that Jen takes a card with a  $\textcircled{1}$  star on it?  $\frac{1}{12}$

(b) What is the probability that Jen takes a card with a  $\textcircled{5}$  triangle on it?  $\frac{5}{12}$

(c) What is the probability that Jen takes a card with a  $\textcircled{6}$  circle on it?  $\frac{6}{12}$  or  $\frac{1}{2}$

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3) Toby has <sup>Total</sup> 9 cards numbered 1 to 9.

He picks a card at random.

Write down the probability that the chosen card is:

- (a) the number <sup>①</sup> 8  $\frac{1}{9}$       ① △ 2 △ 3 △ ④ △ 5 △ 6 △ 7 △ ⑧ △ 9
- (b) an even number <sup>④</sup>  $\frac{4}{9}$
- (c) a number less than 7 <sup>⑥</sup>  $\frac{6}{9}$  or  $\frac{2}{3}$
- (d) a multiple of 4 <sup>②</sup>  $\frac{2}{9}$
- (e) a square number <sup>③</sup>  $\frac{3}{9}$  or  $\frac{1}{3}$
- (f) a prime number <sup>④</sup>  $\frac{4}{9}$

$$12 + 5 + 3 = \textcircled{20} = \text{Total}$$

4) There are 12 red roses, 5 yellow roses and 3 white roses in a vase.

Callum takes a rose, at random, from the vase.

- (a) Write down the probability that he takes a white rose. <sup>③</sup>  $\frac{3}{20}$
- (b) Write down the probability that he takes a red or a white rose.  $12 + 3 = \textcircled{15}$   $\frac{15}{20}$  or  $\frac{3}{4}$
- (c) Write down the probability that Callum takes a rose that is not red.  $\frac{8}{20}$  or  $\frac{2}{5}$   
 $5 + 3 = \textcircled{8}$

Refer to for Explanation: Lesson 18 > Video 2 > **Calculating missing probabilities**

1) Sean throws a biased coin.

The probability of getting tails is 45%.

Work out the probability of getting heads.

$$\begin{array}{r} 100\% = \text{Total} \\ - 45\% = \text{tails} \\ \hline 55\% = \text{Heads} \end{array}$$

55%

2) Tracy plants a daffodil bulb.

The probability that the bulb will grow is 0.81.

What is the probability that the bulb will not grow?

$$\begin{array}{r} 1.00 = \text{Total} \\ - 0.81 = \text{Will grow} \\ \hline 0.19 = \text{Not grow} \end{array}$$

0.19

3) Manchester City play a match of football. The probability that they win the match is 0.67. The probability that they draw the match is 0.18.

Work out the probability that they lose the match.

$$\begin{array}{r} 0.67 = \text{Win} \\ + 0.18 = \text{Draw} \\ \hline 0.85 \end{array}$$

$$\begin{array}{r} 1.00 = \text{Total} \\ - 0.85 = \text{WIN/DRAW} \\ \hline 0.15 = \text{LOSE} \end{array}$$

0.15



4) There are only pink, yellow, green and blue counters in a bag.

The table shows the probability that a counter taken at random from the bag will be pink, green or blue.

Colour	Pink $\xrightarrow{\times 4}$	Yellow	Green $\xrightarrow{\times 2}$	Blue
Probability	$\frac{1}{5} = \frac{4}{20}$	$\frac{3}{20}$	$\frac{3}{10} = \frac{6}{20}$	$\frac{7}{20}$

Work out the probability that the counter taken is yellow.

$$\frac{4}{20} + \frac{6}{20} + \frac{7}{20} = \frac{17}{20}$$

Pink
Green
Blue

$$\frac{3}{20}$$

$$\frac{20}{20} - \frac{17}{20} = \frac{3}{20}$$

Total
Yellow

5) Gemma has a biased spinner.

A spinner has sections labelled 1, 2, 3, 4 and 5.

The table below shows information about some of the probabilities

Number	1	2	3	4	5
Probability	0.09	x 0.11	0.19	0.34	0.27

Work out the value of x.

$$\begin{array}{r}
 0.09 = 1 \\
 0.19 = 3 \\
 0.34 = 4 \\
 + 0.27 = 5 \\
 \hline
 0.89 = \underline{1,3,4,5}
 \end{array}$$

$$\begin{array}{r}
 1.00 = \text{Total} \\
 - 0.89 = \underline{1,3,4,5} \\
 \hline
 0.11 = \underline{2}
 \end{array}$$

$$0.11$$

Refer to for Explanation: Lesson 18 > Video 3 > **Calculating values using probability**

1) There are 30 chocolates in a box.

Some of the chocolates contain nuts and the rest do not.

The probability that a chocolate containing nuts is picked at random from the box is 0.6. =  $\frac{3}{5}$  or  $\frac{6}{10}$

How many of the chocolates in the box contain nuts?

$$\begin{array}{r} 30 \\ \times 0.6 \\ \hline 18.0 \end{array} \quad \text{or} \quad \frac{6}{10} \text{ of } 30 = 18$$

18

(Your choice)

2) A bag contains 600 coloured counters.

The counters are yellow, brown or orange.

There are 123 yellow counters in the bag.

The probability that a brown counter is chosen from the bag is  $\frac{3}{10}$ .

Calculate the number of orange counters in the bag.

$$\begin{array}{r} \text{Yellow} = 123 \\ \text{Brown} = + 180 \\ \hline 303 \end{array} \quad \frac{3}{10} \text{ of } 600 = 180$$

297

$$\begin{array}{r} 600 = \text{Total} \\ - 303 = \text{Yellow} + \text{Brown} \\ \hline 297 = \text{Orange} \end{array}$$

3) There are only pink, yellow, green and blue counters in a bag.

The table shows the probability that a counter taken at random from the bag will be pink, green or blue.

Colour	Pink	Yellow	Green	Blue
Probability	0.4	0.3	0.2	$0.1 = \frac{1}{10}$

There are 130 counters in the bag.

Work out the number of blue counters in the bag.

13

$$\begin{array}{r} 130 \\ \times 0.1 \\ \hline 130 \end{array}$$

or  $\div \frac{1}{10}$  of  $130 = \underline{13}$   
(Your choice)

5) Mrs Mooney is organising a charity raffle.

She sells 360 tickets for £2 each. £720 (Total)

The probability that someone wins a prize is  $0.25 = \frac{1}{4}$

Each prize cost £6

The profit is donated to charity.

Work out how much money Mrs Mooney donates to charity.

$$\begin{array}{r} 360 \\ \times 0.25 \\ \hline 1800 \\ 7200 \\ \hline 9000 \end{array}$$

£180

$$\begin{array}{r} 90 \\ 4 \overline{) 360} \end{array}$$

or  $\frac{1}{4}$  of 360 = 90 Win

$$\begin{array}{r} 90 \\ \times 6 \\ \hline 540 \end{array}$$

$$\begin{array}{r} 720 \\ - 540 \\ \hline 180 \end{array}$$

(I would use the fraction here)