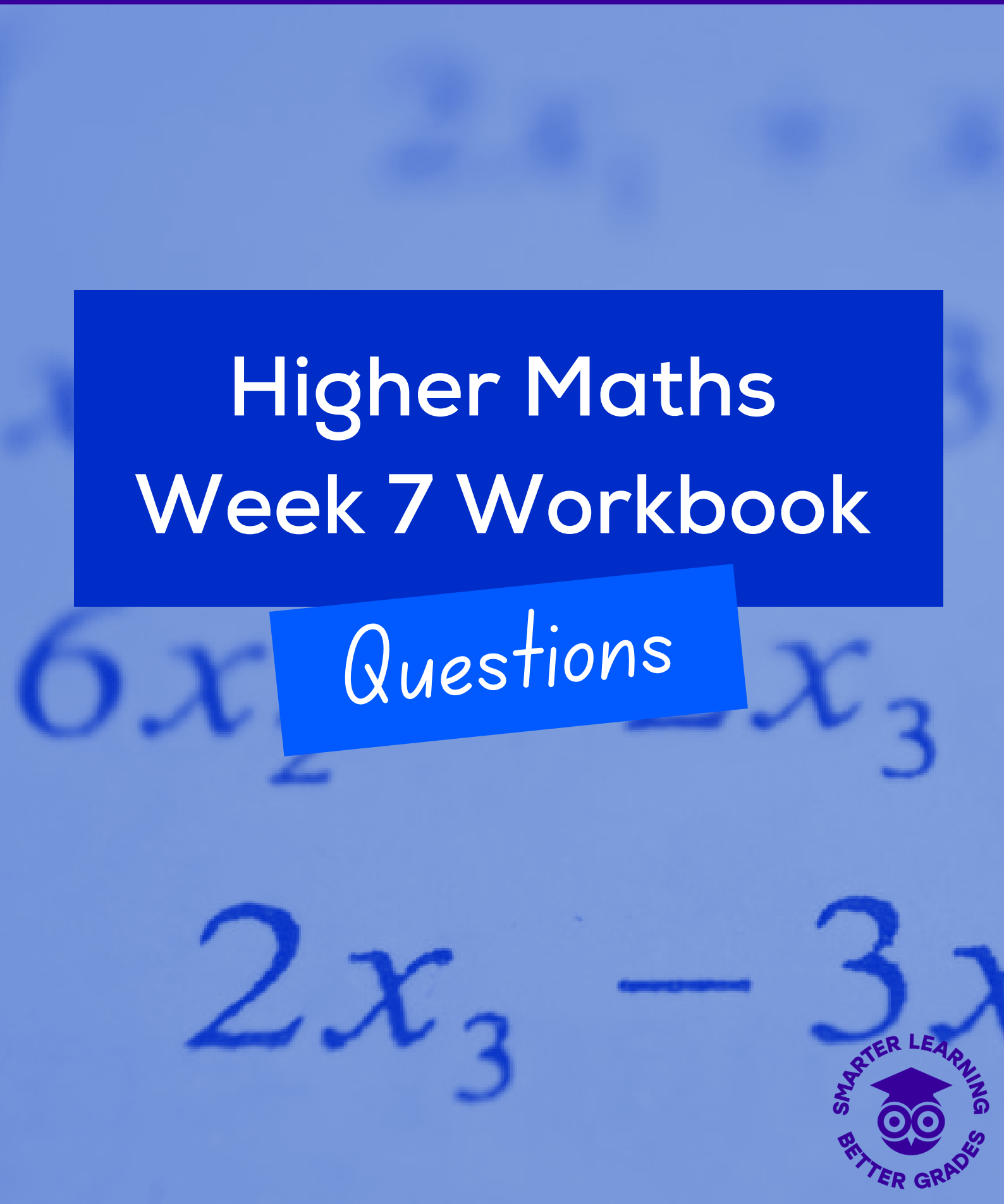
GCSE Boot Camp

Higher Maths
Week 7 Workbook

Questions



GCSE Boot Camp

Topics

Hello! Welcome to the penultimate week of your 8 week GCSE Boot Camp.

Every week you'll get a practice workbook to work through a range of topics, taken from our GCSE Higher Intermediate course.

We've also included links to 2 of our expert tutorial videos on some of these exact questions. That way, if you get stuck, you can try watching one of our tutorial videos with our Maths expert Patricia. For full access to all of the corresponding videos sign up for a SchoolOnline subscription from £8.99 a month.

In next week's email we'll send you the answers to this workbook to download ***PLUS*** a brand new workbook to practice.

Your week 7 workbook topics are:

- Probability and Statistics
- Ratio, Proportion and Rates of Change
- Number - covering topics such as estimation and standard form

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Probability & Statistics 3

Probability

Sample A Higher Calc Paper 2

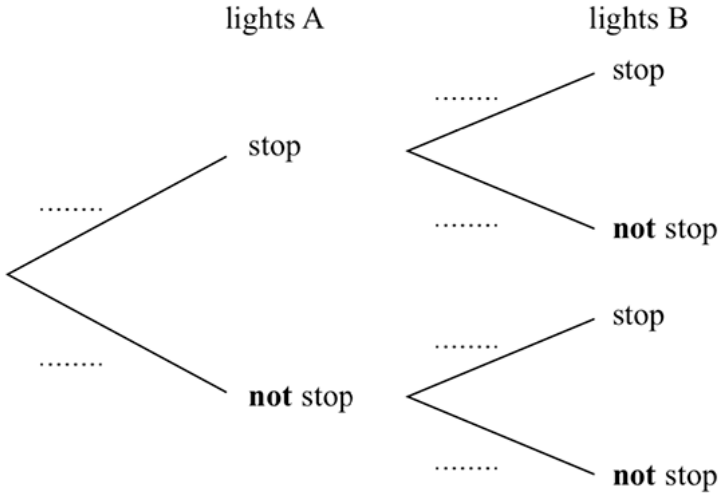
12 A and B are two sets of traffic lights on a road.

The probability that a car is stopped by lights A is 0.4

If a car is stopped by lights A, then the probability that the car is **not** stopped by lights B is 0.7

If a car is **not** stopped by lights A, then the probability that the car is **not** stopped by lights B is 0.2

(a) Complete the probability tree diagram for this information.



(2)

Mark drove along this road.
He was stopped by just one of the sets of traffic lights.

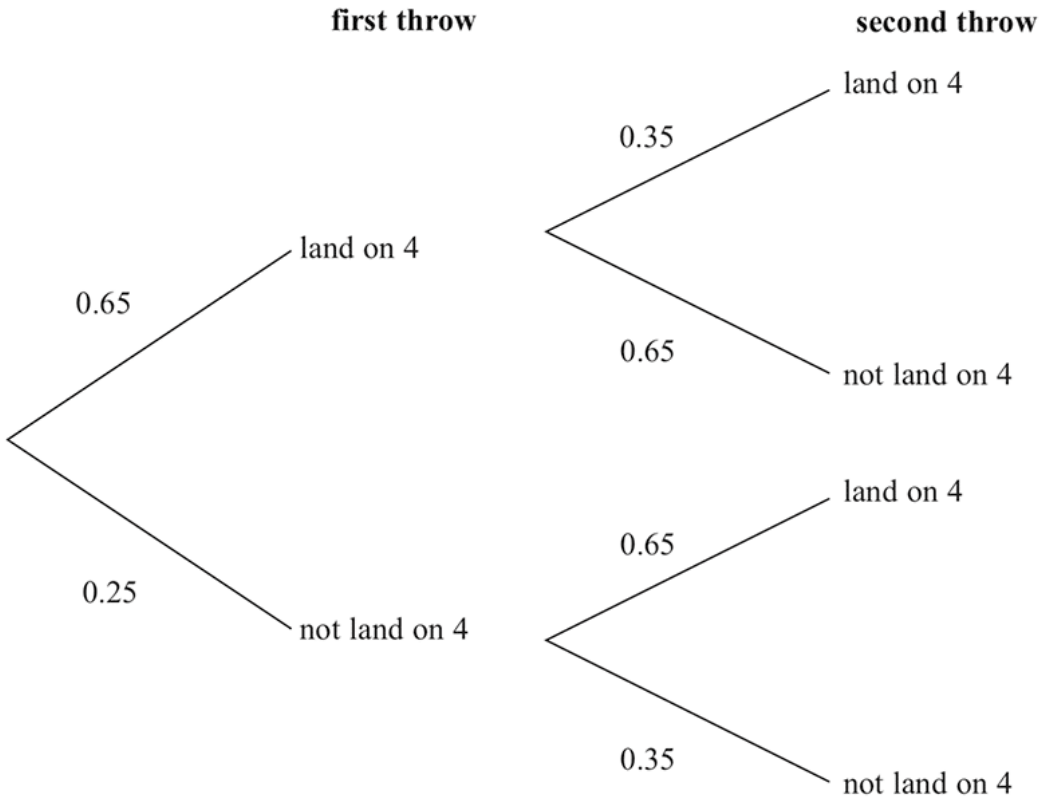
(b) Is it more likely that he was stopped by lights A or by lights B?
You must show your working.

(3)

June 2018 Higher Calc Paper 3

4 When a biased 6-sided dice is thrown once, the probability that it will land on 4 is 0.65
The biased dice is thrown twice.

Amir draws this probability tree diagram.
The diagram is **not** correct.



Write down **two** things that are wrong with the probability tree diagram.

1 .....

.....

2 .....

.....

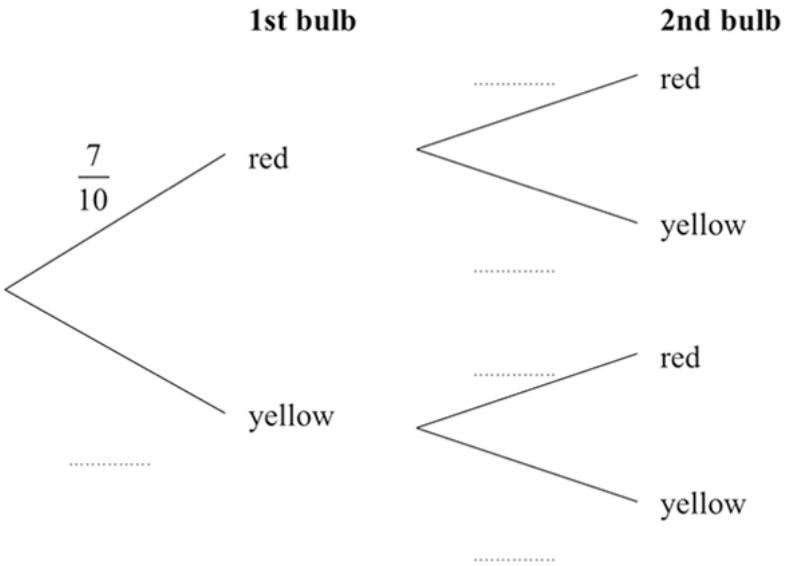
(Total for Question 4 is 2 marks)

23 Yvonne has 10 tulip bulbs in a bag.

7 of the tulip bulbs will grow into red tulips.
3 of the tulip bulbs will grow into yellow tulips.

Yvonne takes at random two tulip bulbs from the bag.
She plants the bulbs.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that at least one of the bulbs will grow into a yellow tulip.

.....

(3)

(Total for Question 23 is 5 marks)

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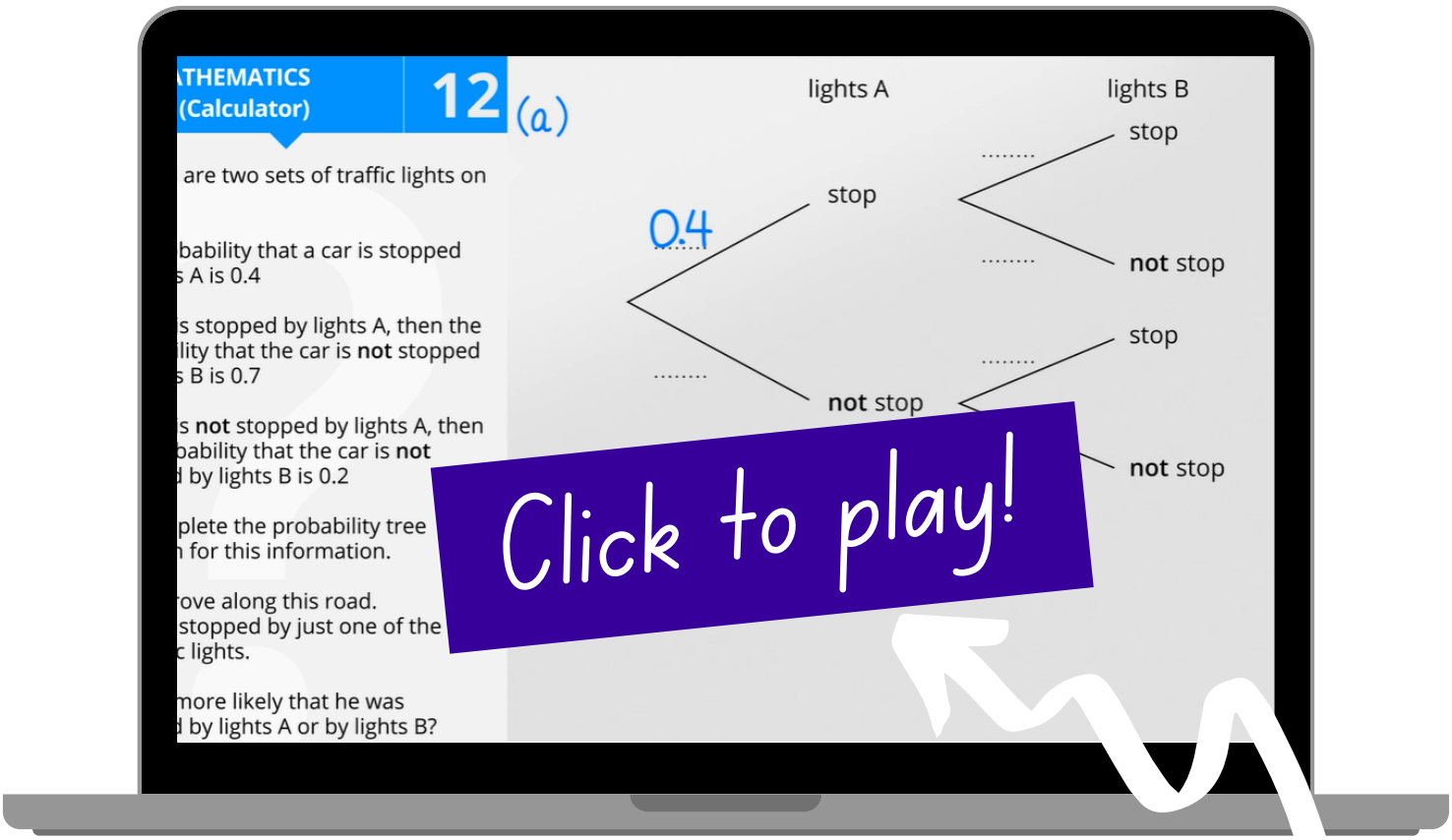
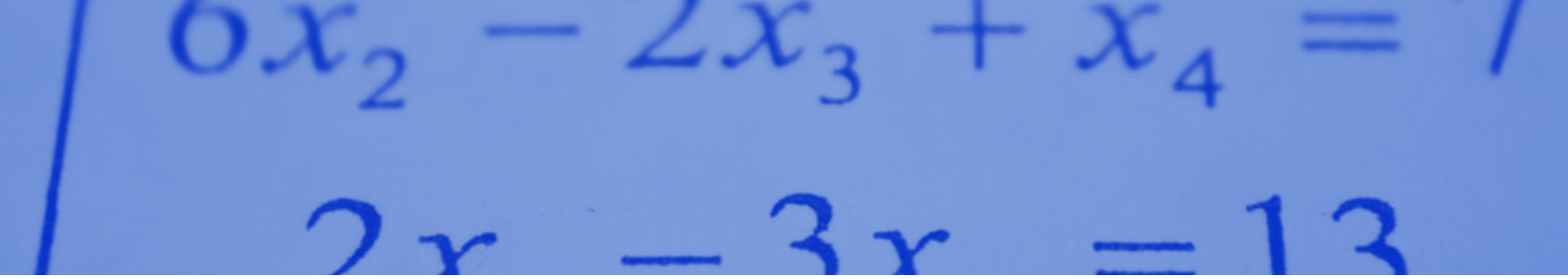
Expert tutorial



Need some extra help? That's what we're here for!

In this video Patricia will explain how to answer the first question on the Probability and Statistics section of your workbook (Q12) on Tree Diagrams.

Grab your pen and paper and remember to take notes! If you want more access to awesome videos like this, sign up for a full SchoolOnline subscription here.



NOTES

Ratio, Proportion & Rates of Change GCSE 3

Distance, Speed, Time

Sample A Higher Calc Paper 2

4 Axel and Lethna are driving along a motorway.

They see a road sign.
The road sign shows the distance to Junction 8
It also shows the average time drivers take to get to Junction 8

To Junction 8
30 miles
26 minutes

The speed limit on the motorway is 70 mph.

Lethna says

"We will have to drive faster than the speed limit to drive 30 miles in 26 minutes."

Is Lethna right?
You must show how you get your answer.

(Total for Question 4 is 3 marks)

Distance / Speed / Time

June 2017 Higher Calc Paper 2

4 Olly drove 56 km from Liverpool to Manchester.
He then drove 61 km from Manchester to Sheffield.

Olly's average speed from Liverpool to Manchester was 70 km/h.
Olly took 75 minutes to drive from Manchester to Sheffield.

(a) Work out Olly's average speed for his total drive from Liverpool to Sheffield.

..... km/h

(4)

Janie drove from Barnsley to York.

Janie's average speed from Barnsley to Leeds was 80 km/h.
Her average speed from Leeds to York was 60 km/h.

Janie says that the average speed from Barnsley to York can be found by working out the mean of 80 km/h and 60 km/h.

(b) If Janie is correct, what does this tell you about the two parts of Janie's journey?

.....

.....

(1)

(Total for Question 4 is 5 marks)

June 2018 Higher Calc Paper 2

6 A force of 70 newtons acts on an area of $20\,cm^2$

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The force is increased by 10 newtons.
The area is increased by $10\,cm^2$

Helen says,

"The pressure decreases by less than 20%"

Is Helen correct?
You must show how you get your answer.

(Total for Question 6 is 3 marks)

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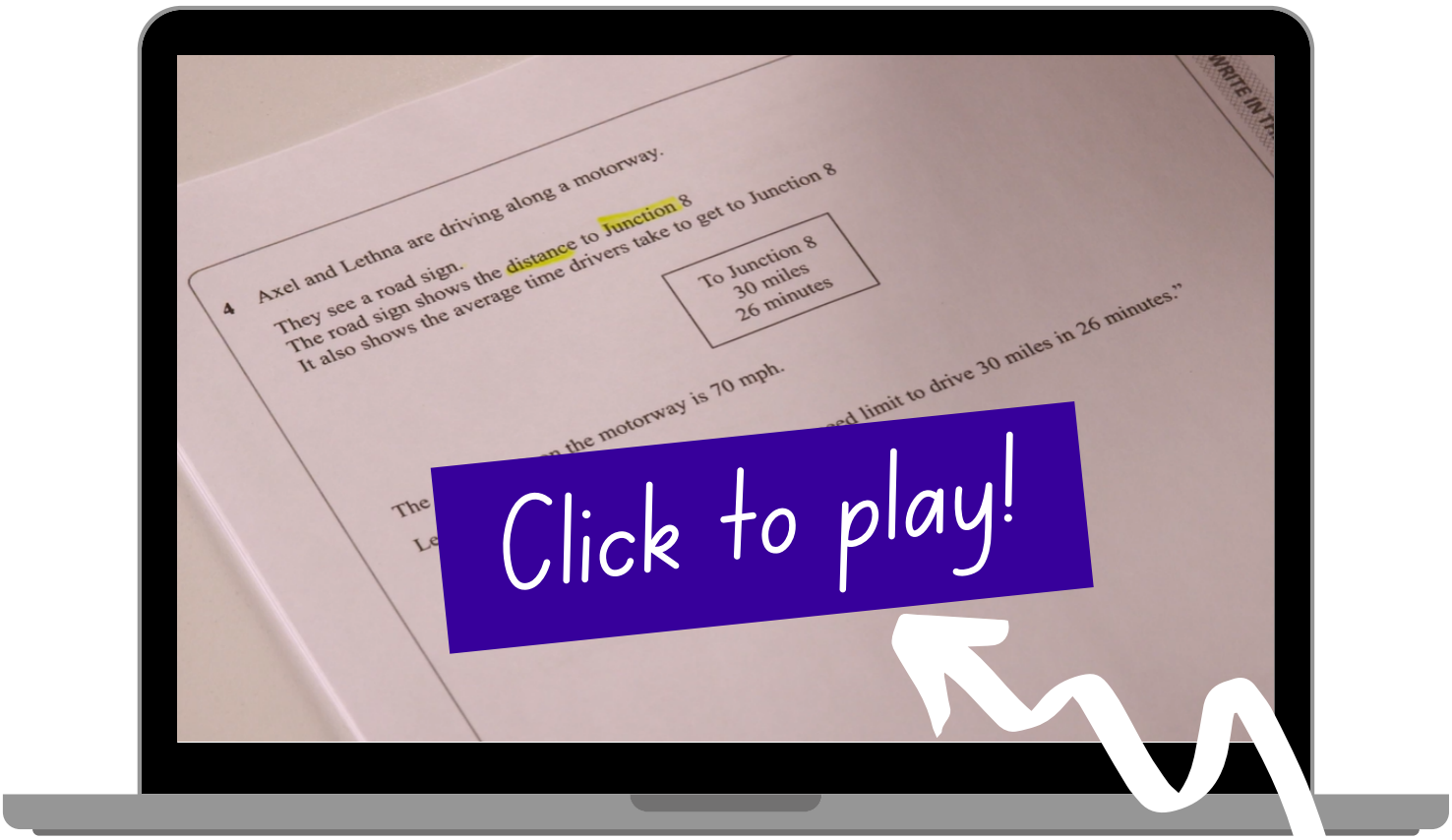
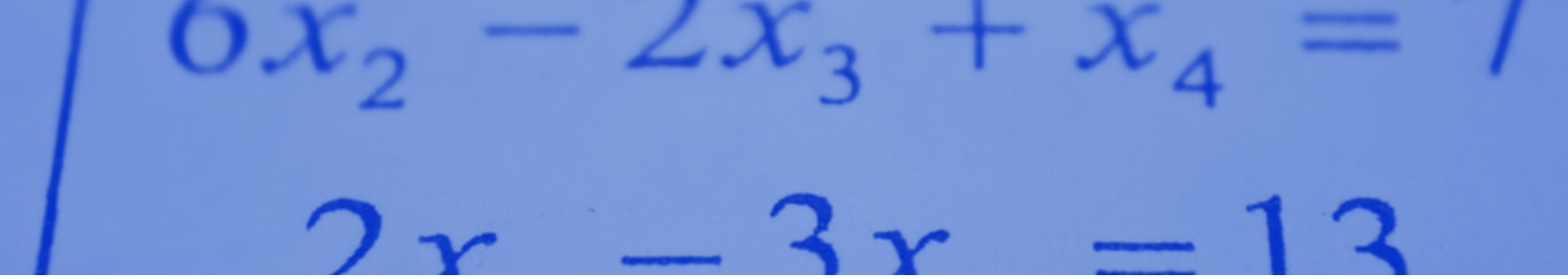
Expert tutorial



Need some extra help? That's what we're here for!

In this video Patricia will explain how to answer the last question on the Ratio, Proportion and Rates of change section in your workbook (Q4) which looks at a Distance, Speed, Time calculation.

Grab your pen and paper and remember to take notes! If you want more access to awesome videos like this, sign up for a full SchoolOnline subscription here.



NOTES

Number GCSE Higher 2

Estimation

Sample A Higher Non-Calc Paper 1

11 One uranium atom has a mass of 3.95×10^{-22} grams.

(a) Work out an estimate for the number of uranium atoms in 1 kg of uranium.

.....

(3)

(b) Is your answer to (a) an underestimate or an overestimate?
Give a reason for your answer.

.....

.....

(1)

(Total for Question 11 is 4 marks)

Standard Form

June 2017 Higher Non-Calc Paper 1

8 (a) Write 7.97×10^{-6} as an ordinary number.

.....

(1)

(b) Work out the value of $(2.52 \times 10^{5}) \div (4 \times 10^{-3})$
Give your answer in standard form.

.....

(2)

(Total for Question 8 is 3 marks)

Standard Form

Sample A Higher Non-Calc Paper 1

9 Work out the value of $(9 \times 10^{-4}) \times (3 \times 10^{7})$
Give your answer in standard form.

.....

(Total for Question 9 is 2 marks)

Ratio - Advanced

10 The surface gravity of a planet can be worked out using the formula

$$g = \frac{6.67 \times 10^{-11}\, m}{r^2}$$

where

m kilograms is the mass of the planet
r metres is the radius of the planet

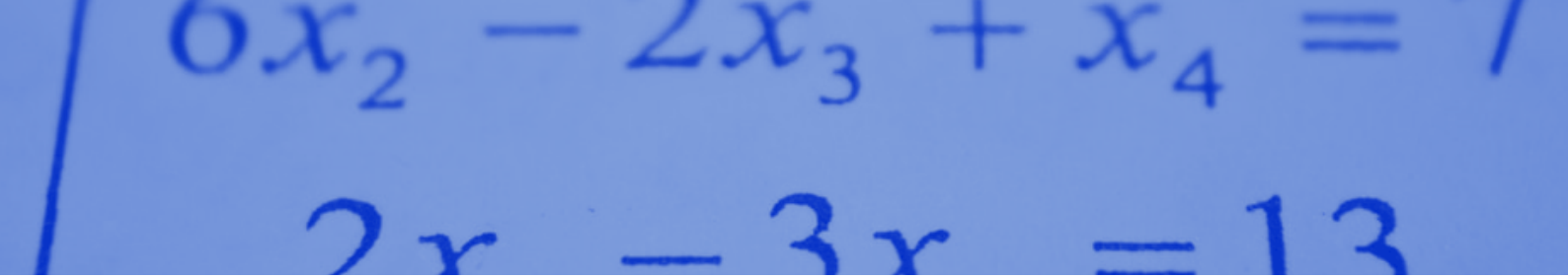
For the Earth and Jupiter here are the values of m and r.

Earth	Jupiter
$m = 5.98 \times 10^{24}$ $r = 6.378 \times 10^{6}$	$m = 1.90 \times 10^{27}$ $r = 7.149 \times 10^{7}$

Work out the ratio of the surface gravity of Earth to the surface gravity of Jupiter.
Write your answer in the form $1 : n$

.....

(Total for Question 10 is 3 marks)



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