GCSE MATHEMATICS

S21-C300

Non-Calculator Assessment Resource D

Foundation Tier

Formula list

Area and volume formulae

Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone:

Curved surface area of a cone = πrl

Surface area of a sphere = $4\pi r^2$

Volume of a sphere = $\frac{4}{3}\pi r^3$

Volume of a cone = $\frac{1}{3}\pi r^2 h$

Kinematics formulae

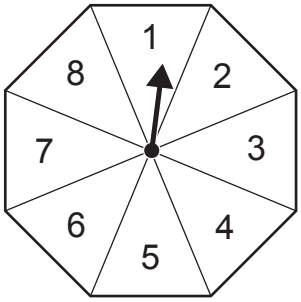
Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the position when $t = 0$ and t is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

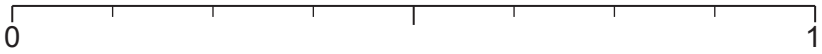
$$v^2 = u^2 + 2as$$

1. *(a)*



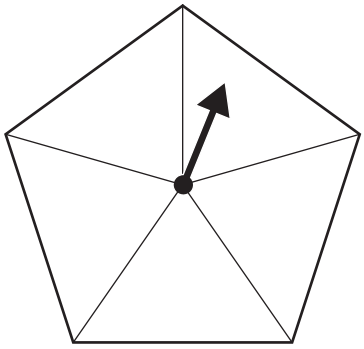
The diagram shows a fair spinner for a simple game.
Rhian needs to score 7 or more with a single spin to win the game.

On the probability scale below, mark with an arrow the probability that Rhian wins the game. [1]



(b) Tomas is playing a game with a different fair spinner.

Here is the shape of his spinner.



The arrow on the probability scale below shows the probability that Tomas scores less than 4 with one spin.

Write five numbers on Tomas' spinner so that the scale is correct. [1]

(c) Simon is playing a game.
The probability that he wins the game is 0·7.

What is the probability that Simon does not win his game? [1]

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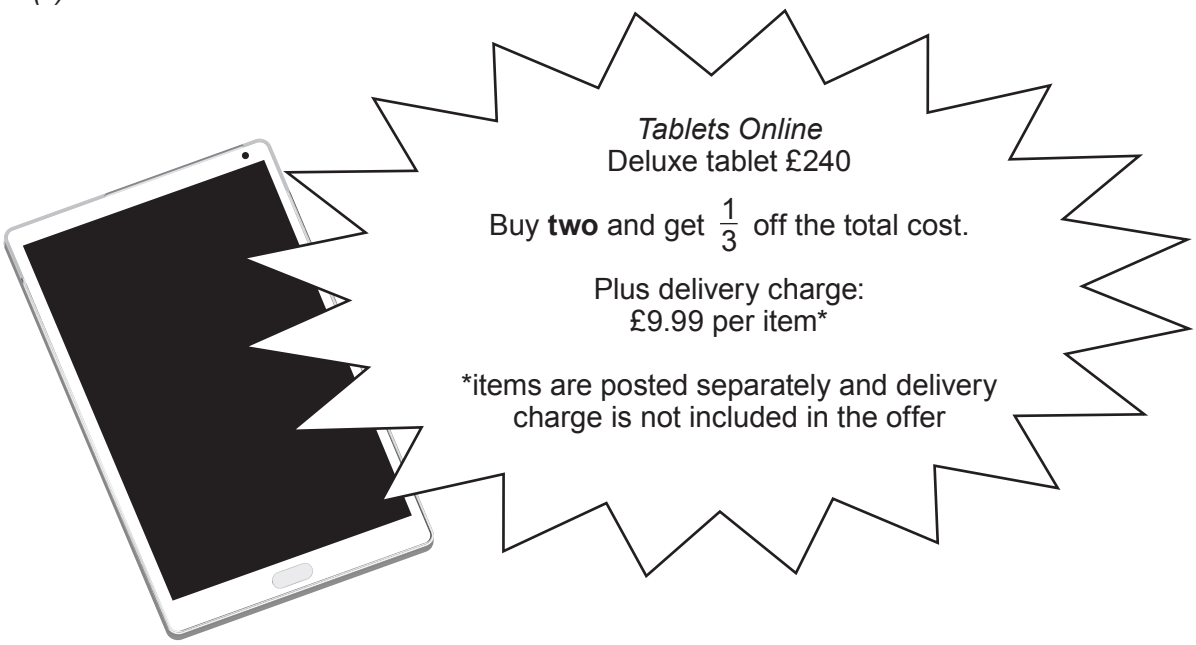
2. *(a)*



Rosie buys two Deluxe tablets from *Tablets Online* and has them delivered.

How much does Rosie pay? [4]

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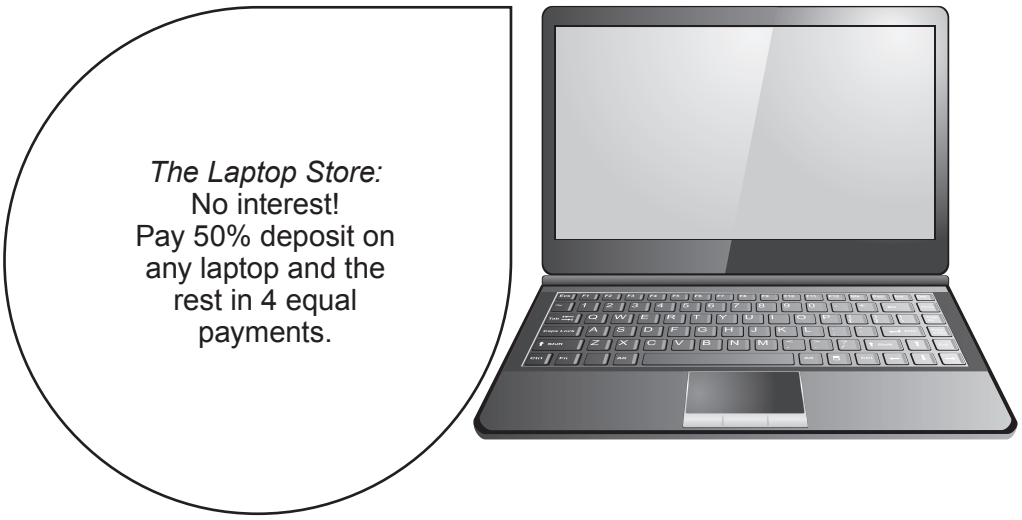
Rosie pays £ .....

(b)



Jim bought a laptop from *The Laptop Store*.
He paid his deposit and the rest of the cost in 4 payments of £108.

How much did Jim pay for his laptop in total? [3]

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Jim paid £ .....

3. *(a)* Eva's grandchildren all live in Wales or Australia.

$\frac{2}{7}$ of her grandchildren live in Wales.

15 of her grandchildren live in Australia.

How many grandchildren does Eva have? [3]

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..... grandchildren

(b) Eva lives in Wales.
When she goes to Australia for a visit, she always changes £400 into Australian dollars (A$).

When she went in 2018, the exchange rate was £1 = A$ 1.70.
When she went in 2016, the exchange rate was £1 = A$ 2.00.

How many more Australian dollars did Eva receive in 2016 than she did in 2018? [3]

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A$ ..... more

4. *(a)* There are 45 swimmers in *Top Swim* club.

All swimmers are learning butterfly and backstroke and are asked which they prefer.

- $\frac{3}{5}$ of all swimmers prefer backstroke.
- The number of juniors is double the number of seniors in the club.
- $\frac{1}{6}$ of the juniors prefer butterfly.

Work out the proportion of swimmers who are seniors and prefer backstroke.
You may use the table to help you. [5]

	Prefer to swim		Total
	Butterfly	Backstroke	
Seniors			
Juniors			
Total			45

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Proportion .....

(b) *The Sharks* club has two types of membership: swimmers or divers.
The ratio of swimmers to divers is 8 : 3.
18 members of the club are divers.

How many members does *The Sharks* club have? [2]

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..... members

5. *(a)* (i) Write $4{\cdot}8 \times 10^{-3}$ as an ordinary number. [1]

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(ii) Work out the value of $(2{\cdot}5 \times 10^{20}) + (9 \times 10^{20})$.
Give your answer in standard form. [2]

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(b) In 2018, the total volume of ice in the Greenland ice sheet was $2{\cdot}99 \times 10^{6}$ km^3.
The total surface area of the ice sheet was $1{\cdot}799 \times 10^{6}$ km^2.

Assuming that the depth of the ice was constant for the whole ice sheet, **estimate** the depth of the ice in 2018.
You must state the units of your answer. [3]

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Depth of ice = ... Units .....

6. Huw has a maths test.

(a) For the first question, Huw divides 752 by a whole number.

His answer, which is correct, is 25 remainder 27.

What whole number did Huw divide by? [3]

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(b) The second question is:

The only food provided for guests at Seaview Hotel is breakfast. The hotel has enough food to make breakfast for 20 guests for 6 days. How long would the food last 30 guests? You may assume each guest eats the same amount of food for breakfast.

Here is Huw's working.

(i) Without working out the correct answer, explain why Huw's answer of 9 days is incorrect. [1]

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(ii) Work out the correct answer. [2]

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..... days

7. Shania has two pieces of ribbon.

One piece is $5\frac{1}{4}$ metres long.

The difference between the lengths of the two pieces is $2\frac{9}{20}$ metres.

Work out the **two** possible lengths of the other piece of ribbon.
Give each of your answers as a mixed number in its simplest form. [4]

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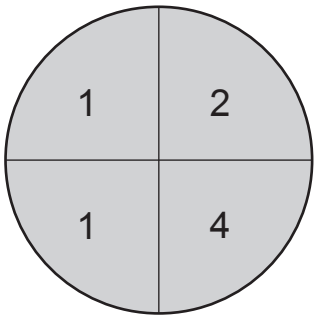
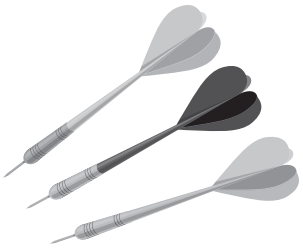
8. The diagram shows a dartboard with 4 sectors of equal size.





Sanjeev throws 3 darts which all hit this dart board.
Each dart is equally likely to hit any sector of the dart board.

He **multiplies** his three numbers to find his score.

Work out the probability that his score is an odd number. [2]

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