EXAM PAPERS PRACTICE

GCSE OCR Math J560

Ratios

Answers

"We will help you to achieve A Star "

Answer 1

Robert has
500 g of sugar
1000 g of butter
1000 g of flour
500 m*l* of milk

(b) Work out the greatest number of shortcakes Robert can make.

SUGAR : $\frac{500}{50} = 10$

BUTTER : $\frac{1000}{200} = 5$

FLOUR : $\frac{1000}{200} = 5$

} 5 × THE RECIPE

5 × 12 = 60

Answer 2

Pavel and Katie share some sweets in the ratio 3 : 8
Katie gets 32 sweets.

(a) How many sweets does Pavel get?

	P	:	K
	3	:	8
×4	?	:	32

×4

? = 3 × 4 = 12

Answer 3

Here are the ingredients needed to make 10 pancakes.

Pancakes	
Ingredients to make **10** pancakes	
300 m*l*	of milk
120 g	of flour
2	eggs

RATIOS

Matthew makes 30 pancakes.

(a) Work out how much flour he uses.

PANCAKES : FLOUR

×3 (10 : 120g) ×3

30 : ?

? = 120 × 3 = 360 ..... g

Answer 4

Sandra has a piece of string 153 cm long.

She cuts the string into three lengths in the ratio 4 : 2 : 3

Work out the length, in centimetres, of each piece of string.

4 : 2 : 3 TOTAL = 9 PARTS.

EACH PART = $\frac{153}{9}$ = 17 cm.

PART 1 : 4 × 17 = 68 cm

PART 2 : 2 × 17 = 34 cm

PART 3 : 3 × 17 = 51 cm

Answer 5

In a box of pens, there are

three times as many red pens as green pens → R = 3G
and two times as many green pens as blue pens. → G = 2×B

For the pens in the box, write down
the ratio of the number of red pens to the number of green pens to the number of blue pens.

SINCE R > G > B, CALL B = 1

R : G : B
6 : 2 : 1
×3 ×2

Answer 6

Rob is learning about the planets.

Rob makes a model of the Sun.
He also makes a model of the planet Jupiter.

Rob is going to hang the two models in the school hall.

Rob wants a distance of 16 m between the two models.
The real distance between the planet Jupiter and the Sun is 8×10^8 km.

Work out the scale Rob should use.
Give your answer in the form $1 : n$

$16\text{m} : 8 \times 10^8 \text{ km}$

in metres

$16\text{m} : 8 \times 10^8 \times 1000\text{m}$

$\div 16$

$\div 16$

$1 : 50\,000\,000\,000$

$1 : 5 \times 10^{10}$

$\frac{8 \times 10^8 \times 1000}{16}$

Answer 7

Here is a list of ingredients for making 18 mince pies.

Ingredients for 18 mince pies
225 g of butter
350 g of flour
100 g of sugar
280 g of mincemeat
1 egg

SCALE FACTOR $= \frac{45}{18} = 2.5$

Elaine wants to make 45 mince pies.

Elaine has

1 kg of butter
1 kg of flour
500 g of sugar
600 g of mincemeat
6 eggs

Does Elaine have enough of each ingredient to make 45 mince pies?
You must show clearly how you got your answer.

NEED

BUTTER : $225 \times 2.5 = 562.5$ g ✓

FLOUR : $350 \times 2.5 = 875$ g ✓

SUGAR : $100 \times 2.5 = 250$ g ✓

MINCEMEAT: $280 \times 2.5 = 700$ g ✗

SINCE $600 < 700$ WE DO NOT HAVE ENOUGH MINCEMEAT

Answer 8

5 schools sent some students to a conference.

One of the schools sent both boys and girls.
This school sent 16 boys.
The ratio of the number of boys it sent to the number of girls it sent was 1 : 2

The other 4 schools sent only girls.
Each of the 5 schools sent the same number of students.

Work out the total number of students sent to the conference by these 5 schools.

BOYS : GIRLS

×16 (1 : 2) ×16

16 : ?

? = 32

TOTAL = 16 + 32

= 48 FOR 1 SCHOOL.

TOTAL FOR 5 SCHOOLS = 5 × 48

$= \frac{10 \times 48^{24}}{2_1}$

= 240

Answer 9

Suha has a full 600 m*l* bottle of wallpaper remover.
She is going to mix some of the wallpaper remover with water.

Here is the information on the label of the bottle.

RATIOS

Wallpaper remover
600 m*l*
Mix $\frac{1}{4}$ of the wallpaper remover
with 4500 m*l* of water

$\frac{1}{4} \times 600$

$\frac{600}{2} = 300$

$\frac{300}{2} = 150\text{mL}$

Suha is going to use 750 m*l* of water.

How many millilitres of wallpaper remover should Suha use?
You must show your working.

WR : WATER
150 : 4500
÷6 ? : 750 ÷6

$? = \frac{150}{6} = \frac{3 \times 5 \times 10}{3 \times 2_1}{}^{5}$

$= \frac{5 \times 5}{1}$

$= 25\text{mL}$

750×

750 ①
1500 ②
3000 ④ +
4500 ⑥

Answer 10

Emma has a digital photo.

Diagram **NOT** accurately drawn

The photo has a width of 720 pixels.
The photo has a height of 540 pixels.

(a) Write down the ratio of the width of the photo to the height of the photo.
Give your ratio in its simplest form.

W : H

÷540 (720 : 540) ÷540

$\frac{4}{3}$: 1

W : H
4 : 3

Answer 11

Colin works on 5 days each week.
Each day he drives from his home to work and from work to his home. → 10 JOURNEYS

Colin pays £3.50 each day to use the car park at work. → 5 PARKINGS

The distance from Colin's home to work is 18 miles.
Colin's car uses one gallon of petrol every 45.2 miles.

1 litre of petrol costs 136.9p → £1·369
1 gallon = 4.546 litres

Work out the total cost for Colin to use his car for work each week.
You must show all your working.

TOTAL DISTANCE = $10 \times 18 = 180$ MILES

TOTAL FUEL = $\frac{180}{45.2}$ GALLONS

GALLONS : LITRES

1 : 4·546

$\times \frac{180}{45.2}$: ? $\times \frac{180}{45.2}$

TOTAL FUEL = $4.546 \times \frac{180}{45.2}$ LITRES

TOTAL COST = (PETROL × COST/LITRE) + (PARKING)

$= 4.546 \times \frac{180}{45.2} \times 1.369 + 5 \times 3.50$

$= 42.2837\ldots$

$= £42.28$

Answer 12

William works out the distance from the model of the Sun to the model of the planet Neptune.

The real distance from the Sun to the planet Neptune is 4.503×10^9 km.

(b) Work out the distance from the model of the Sun to the model of the planet Neptune.
Give your answer in km, correct to 1 decimal place.

DISTANCE: MODEL : REAL

$\times \frac{4.503\times10^9}{1000000}$ { 1m : 1000000 km ; ? : 4.503×10^9 } $\times \frac{4.503\times10^9}{1000000}$

10^6

MODEL DISTANCE $= 1\times \frac{4.503\times10^9}{10^6}$

$a^p \div a^q = a^{p-q}$ $\quad 9-6$

$= 4.503\times10^3$ m

$= 4503$ m

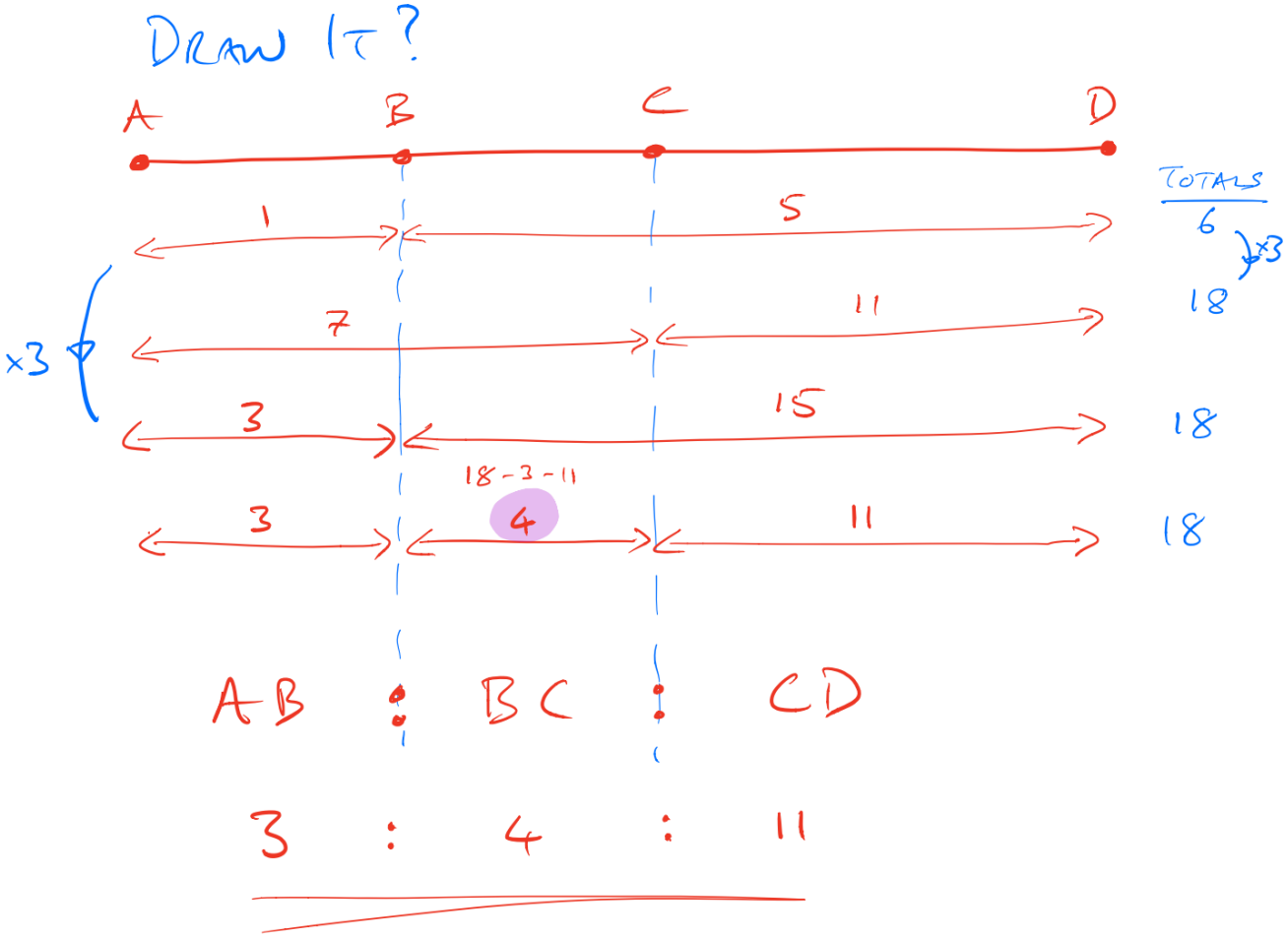
$= 4.5$ km

Answer 13

The points A, B, C and D lie in order on a straight line.

$$AB : BD = 1 : 5$$
$$AC : CD = 7 : 11$$

Work out $AB : BC : CD$



Answer 14

On Tuesday, the number of steak pies Milo needs in his sample is 6 correct to the nearest whole number.

Milo takes at random a pie from the 450 pies made on Tuesday.

(b) Work out the lower bound of the probability that the pie is a steak pie.

NO OF STEAK PIES IN SAMPLE = 6

LB = 5.5 , UB = 6.5

LOWER AND UPPER BOUNDS

"HALF DOWN", "HALF UP"

(FIND LB AND UB BEFORE DOING CALCULATIONS)

$$\text{LB OF P(STEAK)} = \frac{5.5}{15} \times \frac{10}{10}$$

$$= \frac{55}{150}$$

$$= \frac{\cancel{5} \times 11}{\cancel{5} \times 3 \times 10}$$

$$= \frac{11}{30}$$

Answer 15

There are 1200 students at a school.

Kate is helping to organise a party.
She is going to order pizza.

Kate takes a sample of 60 of the students at the school.
She asks each student to tell her **one** type of pizza they want.

The table shows information about her results.

Pizza	Number of students
ham	20
salami	15
vegetarian	8
margarita	17

Work out how much ham pizza Kate should order.
Write down any assumption you make **and** explain how this could affect your answer.

ASSUMING PARTY IS FOR ALL 1200 STUDENTS:

HAM : TOTAL

SAMPLE 20 : 60 (×20)

SCHOOL ? : 1200 (× 1200/60 = 20)

NO OF PORTIONS = 20 × 20

= 400 PORTIONS

IF NOT FOR 1200 STUDENTS, WE'LL NEED LESS PIZZA.