

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Ratio, proportion and rates of change

Sharing amounts in a given ratio (non-calculator)

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments
- You must not use a calculator



Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

Q1.

Brass is made by mixing 7 parts copper to 3 parts zinc.

(a) How much copper is needed to make 30 kg of brass?

(2)

(b) Fred has 35 kg of copper and 12 kg of zinc.

What is the greatest amount of brass he can make?

(3)

(Total 5 marks)

Q2.

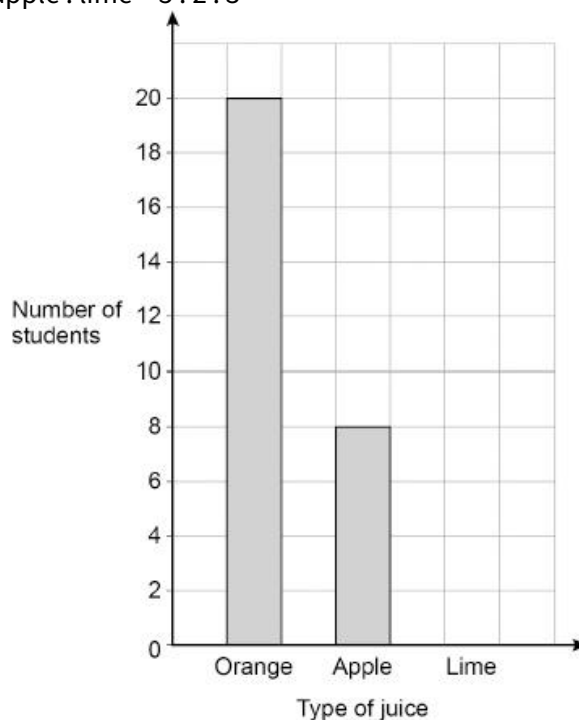
Divide 62 in the ratio 3 : 7

(Total 3 marks)

Q3.

Students choose juice with their school meal in the ratio

orange : apple : lime = 5 : 2 : 3



Complete the bar chart.

(Total 3 marks)

Q4.

The cost of a holiday is £2400

Rana pays a deposit followed by monthly payments, in the ratio

deposit : total of the monthly payments = 3 : 5

She makes 6 equal monthly payments.

Work out her monthly payment.

(Total 4 marks)

Q5.

35 books are either for adults or for children.

number for adults : number for children = 6 : 1

How many **more** books are for adults than for children?

(Total 3 marks)

Q6.

Divide 405 in the ratio 4 : 11

(Total 3 marks)

Q7.

Jon and Nik share some money in the ratio 5 : 2
Jon gets £150 more than Nik.
How much money do they share altogether?

(Total 3 marks)

Q8.

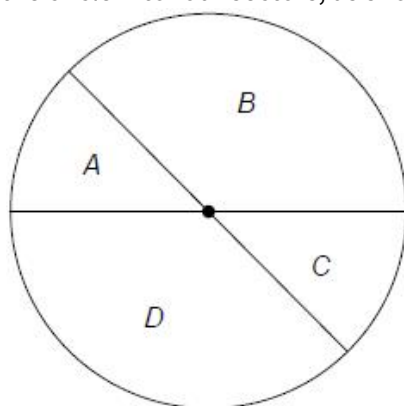
Divide 270 in the ratio 3 : 2 : 1

(Total 3 marks)

Q9.

A circle has radius 6 cm
Two diameters split the circle into four sectors, as shown.

Not drawn
accurately



Area of sector A : Area of sector B = 1 : 3

Work out the area of sector A.

Give your answer in terms of π .

(Total 3 marks)

Q10.

In a school show,
girls : boys = 1 : 1
girls who sing : girls who do not sing = 1 : 2
8 girls **sing** in the show.
How many students are in the show altogether?

(Total 3 marks)

Q11.

(a) In a field
number of sheep : number of cows = 10 : 3

Zak says,

“There are 10 sheep in the field.”

Give a reason why Zak could be wrong.

(1)

(b) In a different field
number of goats : number of pigs = 13 : 4

Priya says,

“There are more than three times as many goats as pigs.”

Is she correct?

Tick **one** box.

☐

Yes

☐

No

☐

Cannot tell

Show working to support your answer.

(1)

(Total 2 marks)

Q12.

Saj makes Rose Pink paint and Cherry Pink paint.
He mixes red paint with white paint as shown.

Rose Pink red : white = 1 : 2

Cherry Pink red : white = 4 : 3

He makes 60 litres of Rose Pink paint.
To this Rose Pink paint he adds
80 litres of red paint and 28 litres of white paint.
Has he now made Cherry Pink paint?
You **must** show your working.

(Total 4 marks)

Q13.

In a **right-angled** triangle
smallest angle : largest angle = 2 : 5
Work out the three angles of the triangle.

(Total 4 marks)

Q14.

Two friends share £240 in the ratio 1 : 3
Work out the larger share.

(Total 2 marks)

Q15.

Cora is revising for two subjects, History and French.
The time she spends revising is in the ratio
History : French = 7 : 2
The time she spends revising for History is 20 hours **more** than for French.
Work out the **total** time she spends revising.

(Total 3 marks)

Q16.

Divide £600 in the ratio 9 : 6 : 5

(Total 3 marks)

Q17.

Ali, Beth and Clare take a test.
The ratio of Ali's score to Beth's score is 5 : 3
Ali scored 10 more marks than Beth.
Clare scored 7 more marks than Ali.
Work out each of their scores.

(Total 3 marks)

Q18.

Ed and Fay shared £330 in the ratio 7 : 4
Ed gives Fay some of his money.
Fay now has the same amount as Ed.
How much does Ed give Fay?

(Total 3 marks)

Q19.

An audience of 21 000 attended a concert at the Manchester Arena.
Adult tickets cost £30 and children tickets cost £10
The ratio of adults to children at the concert was 5 : 2
How much was taken in ticket sales?

(Total 4 marks)

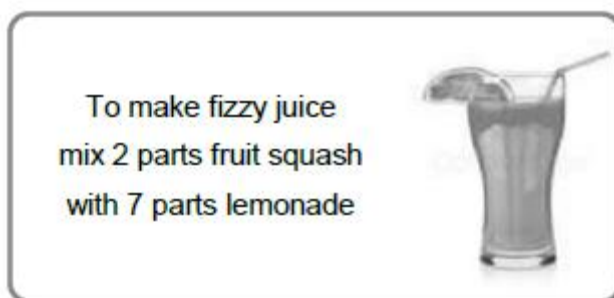
Q20.

A toy box contains red, yellow, blue and green bricks.
25% of the bricks are red.
There are 12 yellow bricks.
The ratio yellow to blue to green is $2 : 3 : 1$
Show that there are 48 bricks in the box

(Total 4 marks)

Q21.

Here are the instructions on a bottle of fruit squash.



Tom has 80 ml of fruit squash.
He also has 210 ml of lemonade.
What is the **maximum** amount of fizzy juice he can make?

(Total 3 marks)

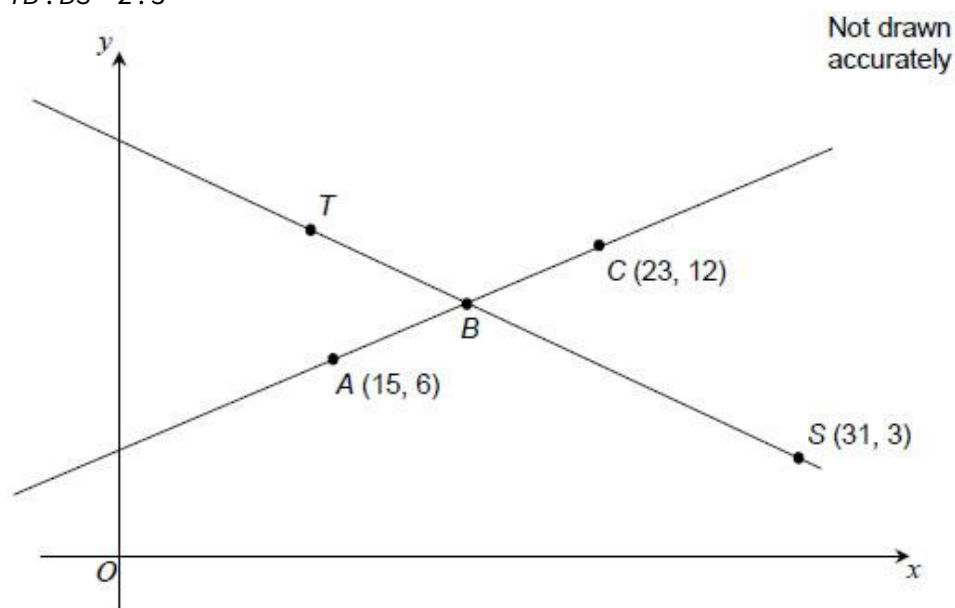
Q22.

Three people share £180.
Billy gets twice as much as Amy.
Chloe gets three times as much as Billy.
Is Chloe's share enough to buy a bike costing £115?
You **must** show your working.

(Total 5 marks)

Q23.

Two straight lines are shown.
 B is the midpoint of AC .
 $TB : BS = 2 : 3$



Work out the coordinates of T .

(Total 4 marks)

Q24.

2476 adults watch a cricket match.

The ratio men : women is 3 : 1

How many **more** men than women watch the match?

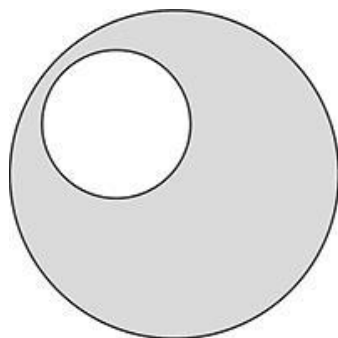
(Total 3 marks)

Q25.

A large circle and a small circle are shown.

The radius of the large circle is 12 cm

radius of large circle : radius of small circle = 4 : 1



Not drawn accurately

Work out the shaded area.

Give your answer in terms of π

(Total 4 marks)

Q26.

Two wire shapes make an earring.

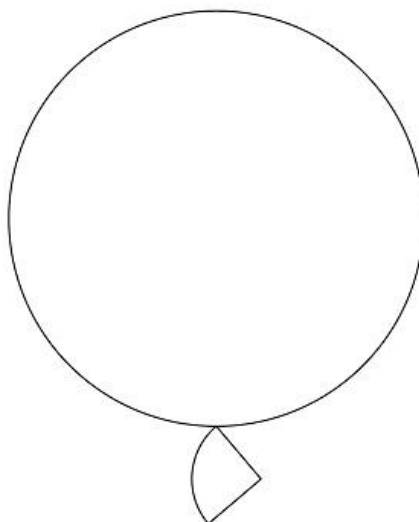
The shapes are

a circle with radius 21 mm

and

a quarter circle.

Not drawn accurately



radius of circle : radius of quarter circle = 7 : 2

(a) Show that the radius of the quarter circle is 6 mm

(1)

(b) Work out the **total** length of the wire in the earring.

Give your answer in the form $a\pi + b$ where a and b are integers.

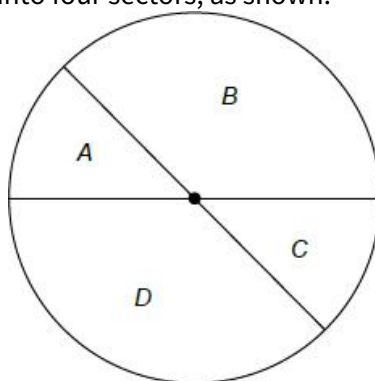
(4)

(Total 5 marks)

Q27.

A circle has radius 4 cm

Two diameters split the circle into four sectors, as shown.



Not drawn accurately

Area of sector A : Area of sector B = 1 : 3

Work out the area of sector A.

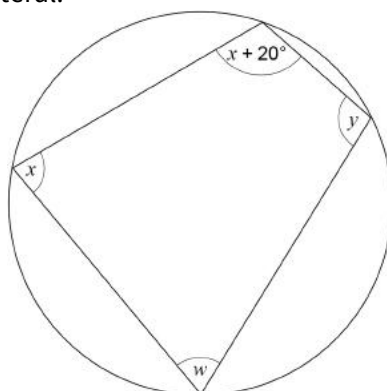
Give your answer in terms of π

(Total 3 marks)

Questions 28 and 29 are **higher** tier only.

Q28.

Here is a cyclic quadrilateral.



Not drawn accurately

$x : y = 5 : 7$

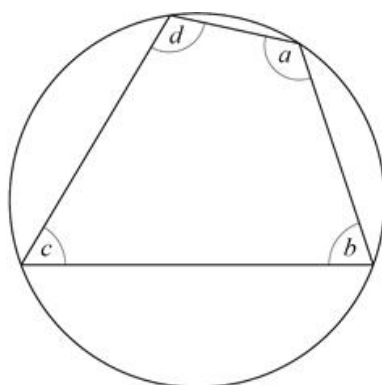
Work out the size of angle w .

(Total 4 marks)

Q29.

Here is a cyclic quadrilateral.

$a : b : c = 9 : 5 : 3$



Not drawn accurately

Work out the size of angle d

(Total 3 marks)