

8300

GCSE MATHEMATICS

Foundation tier – Questions by Topic

Ratio, proportion and rates of change

Reading, converting and calculating with time

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

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

For questions 1 to 11 you must **NOT** use a calculator.



Q1.

Ollie and Rachel run a marathon race.

- (a) Ollie starts the race at 9.15 am

He takes $3\frac{3}{4}$ hours to finish the race.

At what time does he finish?

(2)

- (b) Rachel has a target time of 4 hours 10 minutes.

She has been running for 186 minutes.

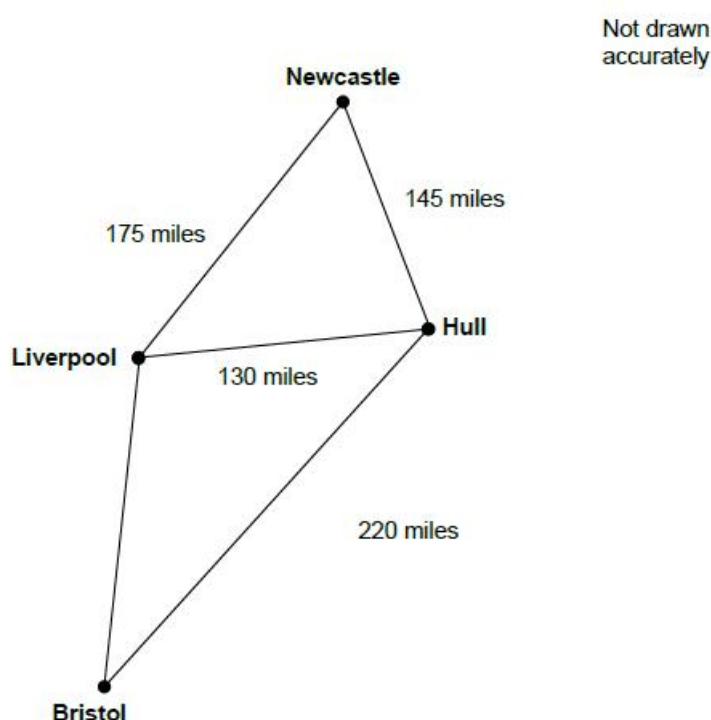
To meet her target, how many minutes does she have left to finish the race?

(3)

(Total 5 marks)

Q2.

The diagram shows distances by road between four cities.



- (a) Sam drives from Newcastle to Hull, and then from Hull to Bristol.
Tim drives from Newcastle to Liverpool, and then from Liverpool to Bristol.
Sam drives 10 **more** miles than Tim.
Work out the distance by road from Liverpool to Bristol.

(3)

- (b) Rob is going to drive 130 miles from Hull to Liverpool.
There are road works for 25 miles of the journey.
He assumes his average speed will be
50 mph where there are road works
70 mph for the rest of the journey.
Using his assumptions, work out his journey time.

(4)

- (c) Rob's assumptions about his average speeds are too high.
How does this affect his journey time?

(1)

(Total 8 marks)

Q3.

Complete the table.

Minutes	Hours
30	$\frac{1}{2}$
40	
	$2\frac{1}{4}$

(Total 2 marks)

Q4.

How many minutes are there in $3\frac{1}{2}$ hours?
Circle your answer.

180.5

210

330

350

(Total 1 mark)

Q5.

A library book was due to be returned on 27 September.
It was actually returned on 14 October.
There is a fine of 8p for every day the book is late.
Work out the total fine.

(Total 3 marks)

Q6.

Alice does a sponsored walk.
She starts from home on Monday at 8 am
She arrives back home 55 hours later.
Work out when she arrives back home.

(Total 2 marks)

Q7.

Samir and Dan run a race.

Samir finishes in $2\frac{1}{2}$ minutes.

Dan finishes in 130 seconds.

Complete the following sentence.

_____ wins by _____ seconds.

(Total 2 marks)

Q8.

(a) Eve drove 180 miles from Cardiff to Leeds.
She drove the first 125 miles at 50 mph then the remaining distance at 60 mph.
Find the total time that Eve was driving.

(4)

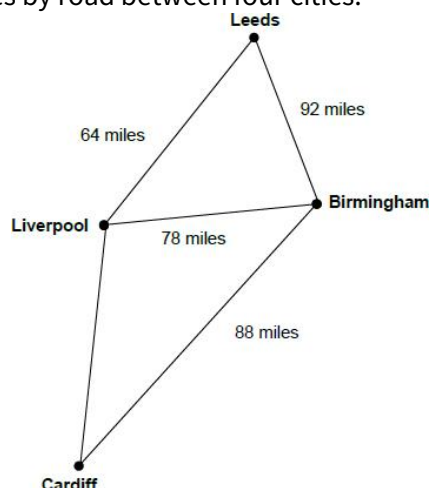
(b) If Eve drove the whole distance at 50 mph, how would this affect her journey time?

(1)

(Total 5 marks)

Q9.

The diagram shows distances by road between four cities.



- (a) Sam drives from Cardiff to Leeds via Birmingham.
Tim drives from Cardiff to Leeds via Liverpool.
Tim drives 18 more miles than Sam.
Work out the distance by road from Cardiff to Liverpool.
- (b) Eve drove the 180 miles from Cardiff to Leeds.
She drove the first 125 miles at 50mph then the remaining distance at 60mph.
Find the total time that Eve was driving.
- (c) If Eve drove the whole distance at 50mph, how would this affect her journey time?

(3)

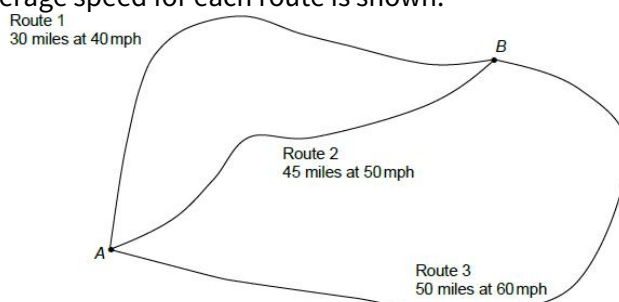
(4)

(1)

(Total 8 mark)

Q10.

The diagram shows three routes, 1, 2 and 3, between two towns, A and B.
The distance and average speed for each route is shown.



Not drawn accurately

- (a) Which of the three routes takes the longest time?
You **must** show your working.
- (b) Samantha and Daniel take the same time to travel from A to B.
Samantha travels along route 1 at 10 mph **faster** than the average speed.
Daniel travels along route 2, but not at the average speed for this route.
Does Daniel travel faster or slower than the average speed for route 2 and by how much?

(4)

Faster

Slower

You **must** show your working.

(3)

(Total 7 marks)

Q11.

Circle the length of time between 4.00 pm and 5.05 pm

55 min

65 min

105 min

125 min

(Total 1 mark)

For the rest of the questions, you may use a calculator.



Q12.

The work in an office takes 200 hours to complete every week.

Each person in the office works 35 hours a week.

(a) What is the smallest number of people needed to complete the work?

(3)

(b) The number of hours each person works is increased to 40 hours a week.

Does the office still need the same number of people?

You **must** show your working.

(2)

(Total 5 marks)

Q13.

A television channel shows 12 minutes of adverts in each half hour.

How many **minutes** of adverts does it show from 5 am to 11 pm?

(Total 3 marks)

Q14.

Jody's pay is £315 per week.

She works for $37\frac{1}{2}$ hours per week.

(a) Work out her **hourly** rate of pay.

(2)

(b) Jody wants to work out her **yearly** pay.

She says,

“There are 4 weeks in a month, so I will multiply £315 by 4

There are 12 months in a year, so I will multiply the answer by 12

$£315 \times 4 \times 12 = £15\ 120$ ”

Does her method give the correct amount for her yearly pay?

Tick a box

☐

No, her yearly
pay is more

☐

Yes

☐

No, her yearly
pay is less

Show working to support your answer.

(2)

(Total 4 marks)

Q15.

How many minutes are there in $5\frac{1}{4}$ hours?

Circle your answer.

315

325

515

525

(Total 1 mark)

Q16.

How many minutes are there in $2\frac{1}{4}$ hours?

135

145

215

225

(Total 1 mark)

Q17.

How many minutes is 225 seconds?

Circle your answer.

$$2\frac{5}{12}$$

$$2\frac{1}{4}$$

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

$$3\frac{3}{4}$$

(Total 1 mark)

Q18.

Circle the length of time between 1.50 pm and 3.35 pm

1 h 45 min

2 h 15 min

2 h 25 min

3 h 5 min

(Total 1 mark)

Q19.

At a school there are six lessons in a day.

In total, the six lessons last for five hours.

(a) Assume that each lesson lasts the same amount of time.

How many minutes long is the final lesson?

(2)

(b) In fact, the first lesson of the day lasts longer than the other lessons.

The other lessons last the same amount of time.

What does this tell you about the length of the final lesson?

Tick **one** box.

☐
☐
☐

It is shorter than the answer to part (a)

It is the same as the answer to part (a)

It is longer than the answer to part (a)

(1)

(Total 3 marks)

Q20.

Which is longer, $\frac{3}{4}$ of a day or 1000 minutes?

You **must** show your working.

(Total 3 marks)

Q21.

In one hour a machine can make

600 nuts

or

720 bolts.

At 3 pm the machine starts working.

It makes 900 nuts and then changes to making bolts.

How many **bolts** will the machine make by 8 pm?

(Total 4 marks)

Q22.

A machine takes 4 seconds to fill a packet of crisps.

(a) In total, how many packets can 35 of these machines fill in 8 hours?

(4)

(b) Each packet of crisps contains 32.5 grams of crisps.

At what rate does a machine put the crisps into the packets?

Give your answer in grams per second.

(2)

(Total 6 marks)

Q23.

The speed of the International Space Station is 27 576 kilometres **per hour**.

(a) The station travels 42 600 kilometres in one orbit.

Work out the number of **full** orbits the station does in **one day**.

(3)

(b) Convert 27 576 kilometres per hour into metres per second.

(3)

(Total 6 marks)

Q24.

A TV series has ten episodes.

Nine episodes are each 50 minutes long.

One episode is 1 hour 42 minutes long.

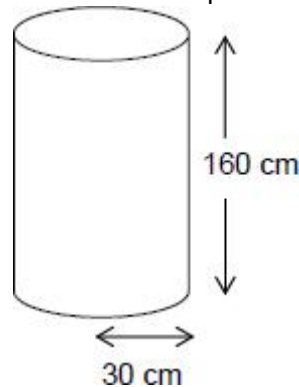
Work out the **total** length of the series.

Give your answer in hours and minutes.

(Total 3 marks)

Q25.

A water tank is a cylinder with radius 30 cm and depth 160 cm.



It is filled at the rate of 0.1 litres per second.

1 litre = 1000 cm³

Does it take longer than 1 hour to fill the tank?

You **must** show your working.

(Total 4 marks)

Q26.

Times for the three parts of a journey are

- 20 minutes
- 40 minutes
- 1 hour 30 minutes.

Work out the **total** time for the journey.

Give your answer in hours.

(Total 2 marks)

Q27.

Concrete from a truck is poured at 10.9 kg **per second** for 30 minutes.

1000 kg = 1 tonne

Is more than 20 tonnes of concrete poured?

Tick **one** box.

Yes

☐

No

☐

You **must** show your working.

(Total 4 marks)

Q28.

The time Shaz takes to run a race is 1 minute 28 seconds **less** than 2 hours.
Work out her time in hours, minutes and seconds.

(Total 2 marks)