AQA

NEW PRACTICE PAPER SET 2

Published November 2015

Please write clearly, in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname Solutions

Forename(s)

Candidate signature

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

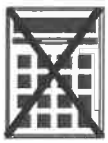
Exam Date Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments.

You must **not** use a calculator.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice

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

Answer **all** questions in the spaces provided.

1 Circle the number that is **not** a multiple of 6

[1 mark]

24 (4x6) 76 (12x6=72) 108 144

2 Which symbol makes this statement correct?

0.062 < 0.52

Circle your answer.

[1 mark]

= < > ⩾

remember greedy crocodile.

3 Solve $x - 7 = 56$

Circle your answer.

[1 mark]

$x = 8$ $x = 49$ $x = 56$ $x = 63$

$x - 7 = 56$

$+7$ $+7$

$x = 63$

$x \rightarrow -7 \rightarrow 56$

$63 \leftarrow +7 \leftarrow 56$

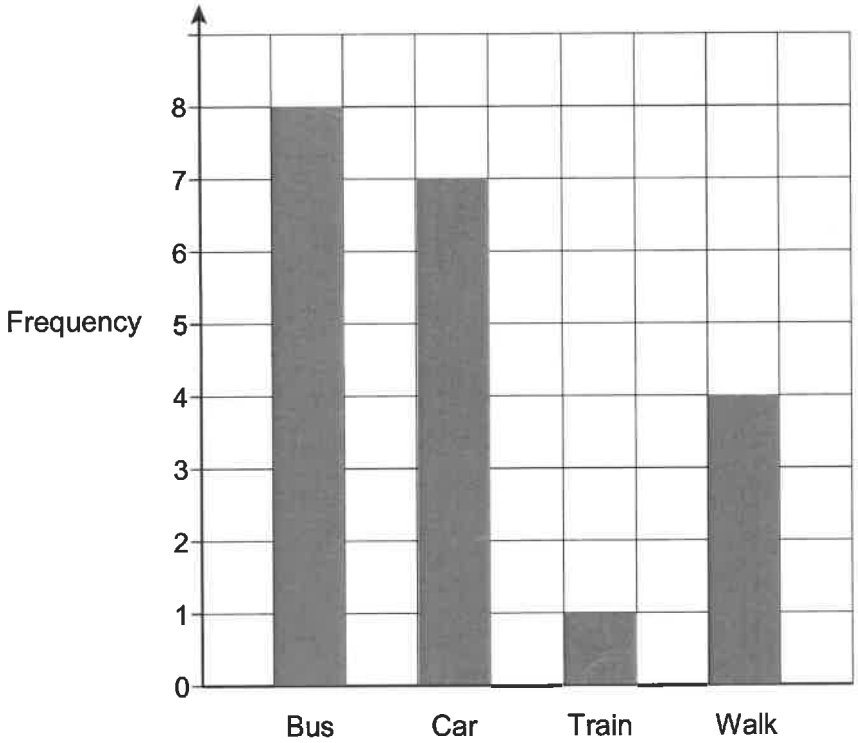
4 Circle the expression that can be written as $2y^2$

[1 mark]

$(2y)^2$ $2 \times 2 \times y$ $2 \times y \times y$ $2 \times 2 \times y \times y$

Turn over for the next question

5 The bar chart shows information about how 20 students travel to school.



Show the information in a pictogram.

Use the key given.

try to keep in columns as well

[3 marks]

Key : ○ represents 2 students

Bus	○ ○ ○ ○
Car	○ ○ ○ ◐
Train	◐
Walk	○ ○

6 (a) Work out $\frac{3}{5}$ of 200

[2 marks]

200 ÷ 5 (find $\frac{1}{5}$) = 40

So $\frac{3}{5}$ 40 × 3 = 120

Answer 120

6 (b) Work out 25.8 + 12.6 ÷ 2

[2 marks]

B Division first!

I

(D) 12.6 ÷ 2 = 6.3

M

(A) 25.8
S + 6.3
32.1
1

Answer 32.1

7 Simplify $7a + 5b + 3a - 2b$ sign in front of term

[2 marks]

$7a + 3a = 10a$ $5b - 2b = 3b$

Answer $10a + 3b$

Can't add apples to banana's

8 A bag contains red counters and blue counters in the ratio 3 : 5

What fraction of the counters are red?

Circle your answer.

[1 mark]

$\frac{1}{3}$ $\frac{3}{5}$ $\frac{3}{8}$ $\frac{5}{8}$

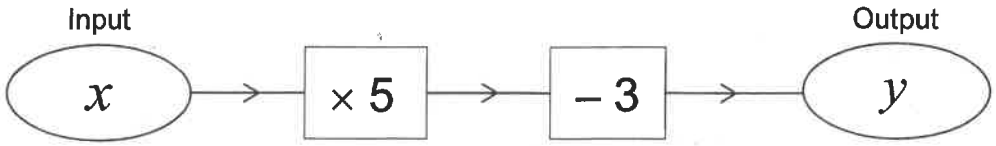
number of parts $3 + 5 = 8$ parts.

3 : 5

red : blue.

3 red out of 8 $\frac{3}{8}$.

9 Here is a number machine.



9 (a) Work out the **output** when the input is 12

[1 mark]

$12 \times 5 = 60$

$60 - 3 = 57$

Answer 57

9 (b) Work out the **input** when the output is 27

[2 marks]

$x \Leftarrow \div 5 \Leftarrow +3 \Leftarrow y$

$6 \Leftarrow \div 5 \Leftarrow +3 \Leftarrow 27$

Answer 6

9 (c) Write y as an expression in terms of x.

[1 mark]

$x \times 5 - 3 = y$

Answer $y = 5x - 3$

10 In a quiz, teams are asked 20 questions.

Teams score

3 points for a correct answer

0 points for questions not attempted

–2 points for an incorrect answer.

10 (a) Team A has these results.

	Correct	Not attempted	Incorrect
Number of questions	12	5	3

Work out the total number of points Team A scores.

[2 marks]

$12 \times 3 = 36$ $3x - 2 = -6$.

$36 + (-6)$. add some cold gets colder

Answer 30.

10 (b) Team B answers 16 out of 20 questions correctly.

Work out the percentage of questions Team B answers correctly.

[2 marks]

$\frac{16}{20} \xrightarrow{\times 5} \frac{80}{100}$ so 80%

$\times 5$

Answer 80% %

16 x 5 is tough. So do 16 x 10 then half it.

10 (c) After 17 questions, Team C has 35 points.

After 20 questions, Team C has 34 points.

How many of the last three questions are answered correctly, not attempted or answered incorrectly?

[2 marks]

3 question total -1
two wrong, one right.

Correct 2 1

Not attempted 0

Incorrect 2

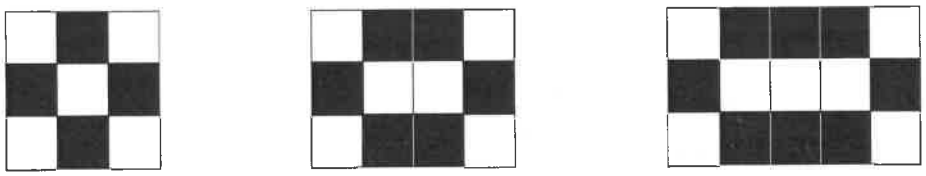
Turn over for the next question

be systematic 3 Question.

Correct	Not attempted	Incorrect	total
3	0	0	9
2	1	0	6
2	0	1	4
1	1	1	1
1	0	2	-1 ✓

11 A sequence of patterns uses black squares and white squares.

Here are the first three patterns.



Pattern 1 Pattern 2 Pattern 3

4 +2 6 +2 8.

11 (a) Circle the expression for the number of black squares in Pattern n.

[1 mark]

$4n$ $n + 2$ $6n - 2$ $2n + 2$

11 (b) Will the number of black squares always be even?

Tick a box.

Yes ☑ No ☐

Give a reason for your answer.

[1 mark]

2×n is even +2 even.

even + even = even.

12 82 children visit a sports centre.

50 of the children swim.

At least one adult is needed for every 12 children who swim.

The other 32 children dance.

At least one adult is needed for every 15 children who dance.

Work out the **minimum** number of adults needed for the 82 children.

[4 marks]

Swim

12
24
36
48 } 4

need one more.

(5)

Dance

15
30 } 2

need one more

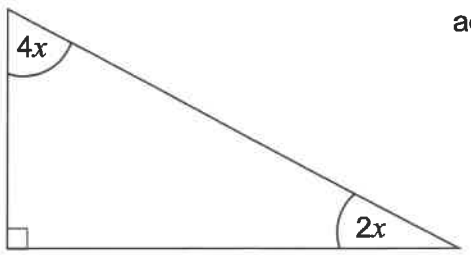
(3)

\+

Answer 8 adults required.

13 Work out the value of x.

Not drawn accurately



15
6)98

[3 marks]

$4x + 2x + 90 = 180$

$6x + 90 = 180$

$x \rightarrow \times 6 \Rightarrow +90 \Rightarrow 180$

$15 \leftarrow \div 6 \leftarrow -90 \leftarrow 180$

Answer 15 degrees

14 (a) The sum of two square numbers is 180

What are the **two** square numbers?

[2 marks]

1, 4, 9, 16, 25, 36, 49, 64, 81, 100,
121, 144, 169, 196

Answer 36 and 144

So number pairs (1, 179) (4, 176) (9, 171) (16, 164) (25, 155)
(36, 144) ✓

14 (b) Kim says,

"The sum of any two **different** square numbers is **always** even."

Is she correct?

Write down a calculation to support your answer.

[1 mark]

No eg 1 + 4 = 5 not even

15 A piano competition takes place every 3 years.
A violin competition takes place every 4 years.

Both competitions took place in 2009

15 (a) In which of these years did the **violin** competition take place?
Circle your answer.

[1 mark]

1992 1993 1994 1995

1993 1997 2001 2005 2009
-4 -4 -4 -4

15 (b) When is the next year after 2009 that **both** competitions will take place?

[1 mark]

piano 2009, 2012, 2015, 2018, 2021, 2024, 2027

violin 2009, 2013, 2017, 2021

Answer 2021

15 (c) In any leap year, the number made by the last two digits is divisible by 4
For example, 1996 and 2004 were leap years because 96 and 04 are divisible by 4

Give a reason why the violin competition will **never** take place in a leap year.

[1 mark]

leap years are every 4 years,
violin comp every 4 years.
2009 not a leap year.

16 Work out the value of $4(2x + 3y)$ when $x = 8$ and $y = -3$

[2 marks]

$4(2x+3y) = 8x + 3y$

$= (8 \times 8) + (3 \times -3)$

$= 64 + (-9)$

$= 55$

Answer 55

all multiples of 5.

17 Factorise $15x + 35y - 40z$

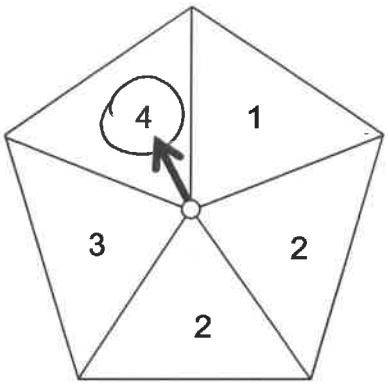
[1 mark]

$5(3x + 7y - 8z)$

Answer

18 Joanne has a fair five-sided spinner.

total = 5



18 (a) Write down the probability of scoring a 4 with one spin.

[1 mark]

Answer $\frac{1}{5}$

18 (b) Work out the probability of scoring a **total** of 4 with two spins.

Possibilities

[3 marks]

1 + 3 $\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$ AND ×

3 + 1 $\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$ OR +

2 + 2 $\frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$

Prob. of a 1 $\frac{1}{5}$ $\frac{1}{25} + \frac{1}{25} + \frac{4}{25} = \frac{6}{25}$

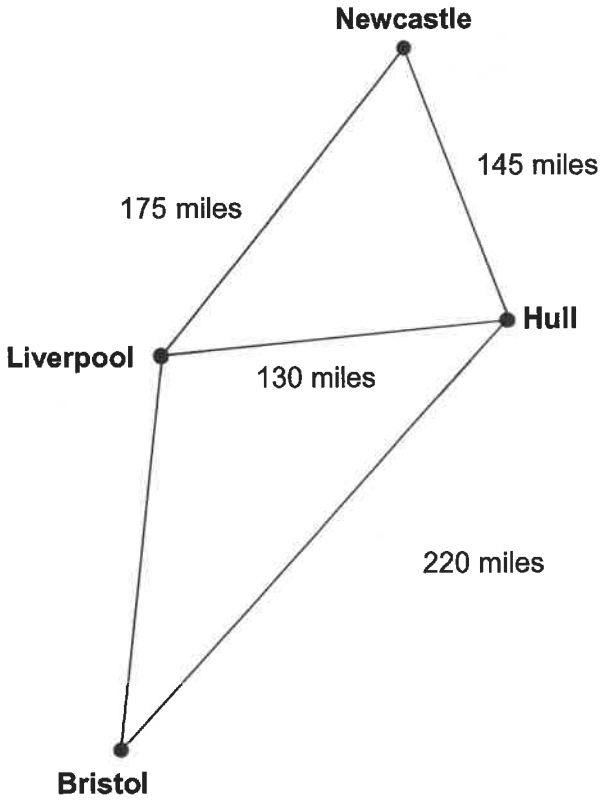
Prob. of a 3 $\frac{1}{5}$

Prob. of a 2 $\frac{2}{5}$

Answer $\frac{6}{25}$

19 The diagram shows distances by road between four cities.

Not drawn accurately



19 (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 marks]

Sam = 145 + 220 = 365 miles

newcastle to liverpool

Tim total = 365 - 10 = 355 - 175

= 180 miles

Answer 180 miles

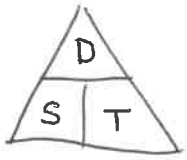
19 (b) Rob is going to drive 130 miles from Hull to Liverpool.

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 marks]

130 - 25 = 105 miles without road works

Road works = $\frac{25}{50} = \frac{1}{2} = 0.5$ ← half an hour or 30 mins

No road works = $\frac{105}{70} = 1.5 = \frac{3}{2}$ ← 1.5 hours = 1 hr 30 mins

1 hr 30 + 30 mins = 2 hrs

Answer 2 hrs

19 (c) Rob's assumptions about his average speeds are too high.

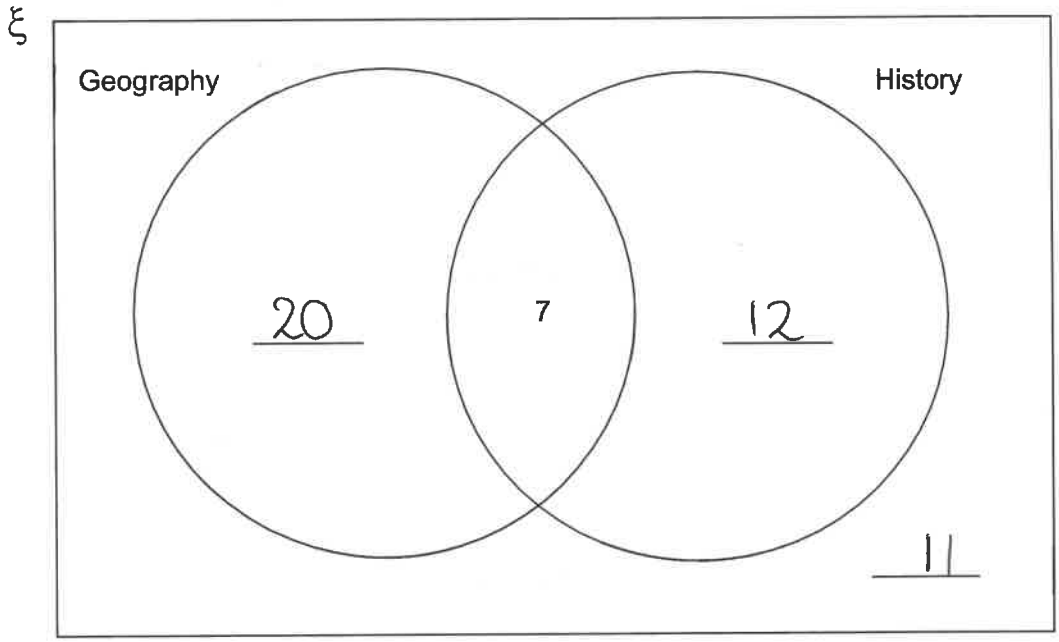
How does this affect his journey time?

[1 mark]

It will take longer / more time as his speed will be lower

20 50 students are asked if they study Geography or History.

The Venn diagram shows some information about their answers.



20 (a) What does the number 7 on the diagram represent?

[1 mark]

Those who do geography and history

20 (b) 20 students study Geography but **not** History.

19 students study History.

Complete the Venn diagram.

[3 marks]

includes those who do geography also

19 − 7 = 12 do just History

50 − 20 − 7 − 12 = 11

to go on the outside

21 Here are the instructions on a bottle of fruit squash.

To make fizzy juice
mix 2 parts fruit squash
with 7 parts lemonade

21 (a) How much fruit squash is needed to make 450 ml of fizzy juice?

[2 marks]

2 : 7
add = 9

total
450 ÷ 9 = 50ml
50ml × 2 = 100ml
from the ratio

Answer 100 ml

21 (b) 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?

[3 marks]

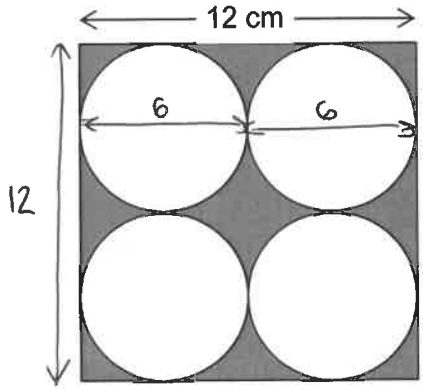
FS L
80ml : 210ml
2 : 7

fruit squash = 80 ÷ 2 = 40
40 × 7 = 280 ← not enough lemonade only 210ml
other part

210 ÷ 7 = 30 × 2 = 60ml ← enough fruit squash
210 + 60 = 270ml

Answer 270 ml

22 Four identical circles just fit inside a square as shown.



Not drawn accurately

Work out the area of the shaded section.

Give your answer in terms of π.

[4 marks]

Area of square $= 12 \times 12 = 144\ cm^2$

Area of one circle $= \pi r^2$ one circle

Diameter $= 6$

Radius $(r) = 3$ $\pi \times 3^2 = 9\pi\ cm^2$

four circles

$9\pi \times 4 = 36\pi\ cm^2$

Remaining area $= 144 - 36\pi\ cm^2$

Answer $144 - 36\pi\ cm^2$

23 Bag A contains 10 blue balls and 20 red balls. Total = 30

Bag B contains 8 blue balls and 12 red balls. Total = 20

A ball is chosen at random from each bag.

Jo says,

"It is more likely that a blue ball is chosen from Bag A than Bag B because there are more blue balls in Bag A."

Is she correct?

You **must** show your working.

[3 marks]

Bag A Blue = $\frac{10}{30} = \frac{1}{3}$

Red = $\frac{20}{30} = \frac{2}{3}$

Bag B Blue = $\frac{8}{20} = \frac{1}{5}$

Red = $\frac{12}{20} = \frac{3}{5}$

Yes, there are a higher proportion of blue balls in bag A than bag B, $\frac{1}{3}$ is greater than $\frac{1}{5}$

24 Which of these has the greatest value?

Circle your answer.

[1 mark]

6.15×10^4 61 499 6.2×10^3 61.6×10^3

61500 6200 61600

25 Jack works out the answer to $\dfrac{\sqrt{98.5} - 12.1}{-0.8}$

He says the answer is negative.

Is he correct?

You **must** show your working.

take the largest

[2 marks]

$\sqrt{98.5}$ = between 9 and 10 because $9^2 = 81$ and $10^2 = 100$

$10 - 12.1 = -2.1$ negative ÷ negative = positive

-0.8 so NO

26 A ball is dropped from a height of 50 metres.

After each bounce, the ball reaches 20% of its previous height.

How high does it reach after the second bounce?

[2 marks]

20% of 50 = 10 metres First bounce

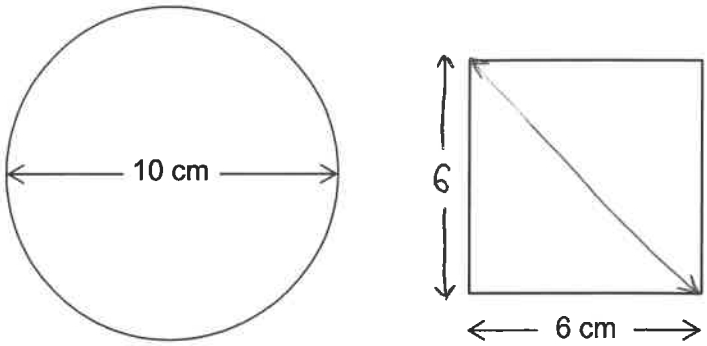
20% of 10 = 2 metres

Answer 2 metres

28 A circle has diameter 10 cm

A square has side length 6 cm

Not drawn accurately



Use Pythagoras' theorem to show that the square will fit inside the circle without touching the edge of the circle.

[3 marks]

$a^2 + b^2 = c^2$

$6^2 + 6^2 = c^2$

$36 + 36 = \sqrt{74}$ is less than 10 because $10^2 = 100$

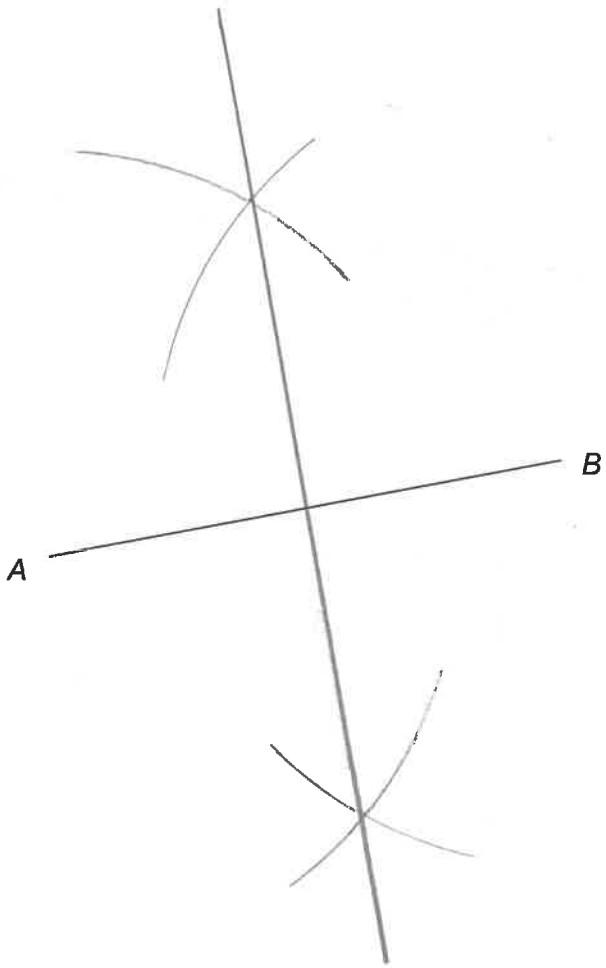
so it will fit

END OF QUESTIONS

27 Use a ruler and a pair of compasses in this question.

Construct the perpendicular bisector of *AB*.

[2 marks]



Turn over for the next question