

Please write clearly in block capitals.

Centre number

Candidate number

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Tuesday 19 May 2020

Morning

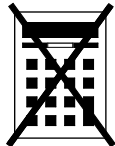
Time allowed: 1 hour 30 minutes

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.
- Fill in the boxes at the top of this page.
- 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.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- 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.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
TOTAL	

Advice

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



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

1 Here are some numbers.

5	5	8	13	14	15	17
---	---	---	----	----	----	----

Circle the range.

(biggest - smallest)
 $17 - 5 = 12$

[1 mark]

5

11

12

13

2 Circle the value of the digit 5 in 256934

[1 mark]

5000

500 000

50

50 000

3 Work out $-2 - 5$

Circle your answer.

[1 mark]

-7

-3

3

7

5 ↓
-2
-3
-4
-5
-6
-7



- 4 What is 680 millimetres in centimetres?
Circle your answer.

0.68 cm

6.8 cm

68 cm

6800 cm

$$1 \text{ cm} = 10 \text{ mm}$$

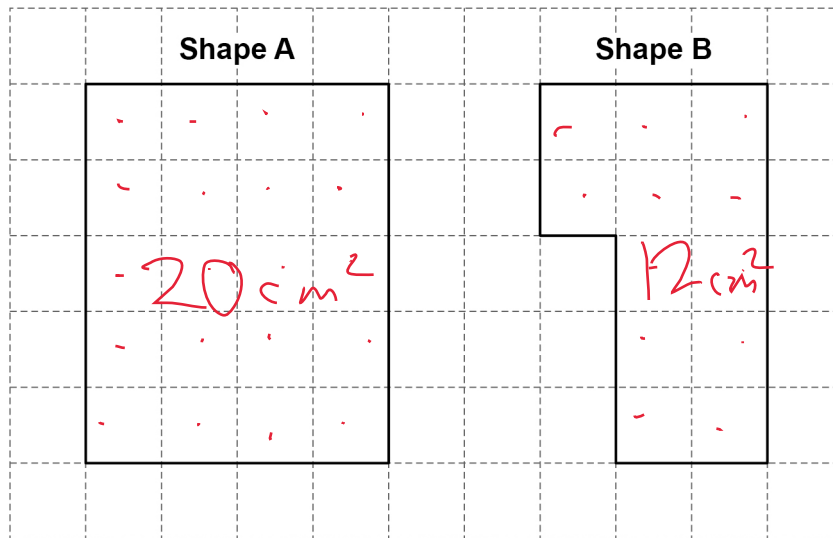
$\times 10$

$\div 10$

[1 mark]

$$680 \div 10 = 68$$

5



Work out area of Shape A : area of Shape B

Give your answer in its simplest form.

[2 marks]

$$20 : 12$$

$$\div 4$$

$$5 : 3$$

Answer _____ : _____

Turn over ►



6 (a) Samir and Dan run a race.

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

Dan finishes in 130 seconds.

$$\begin{array}{l} 2 \text{ min} = 120 \text{ sec} \\ \frac{1}{2} \text{ min} = 30 \text{ sec} \end{array} \left. \vphantom{\begin{array}{l} 2 \text{ min} = 120 \text{ sec} \\ \frac{1}{2} \text{ min} = 30 \text{ sec} \end{array}} \right\} \underline{150 \text{ sec}}$$

Complete the following sentence.

[2 marks]

Dan wins by 20 seconds.

Lower time means he was faster

6 (b) 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.

$$\begin{array}{l} 24 \text{ hours} = 1 \text{ day} \\ 48 \text{ hours} = 2 \text{ days} \\ 55 - 48 = 7 \text{ hours} \end{array}$$

[2 marks]

2 days and 7 hours

Mon Tue Wed + 7 hours

$$8 \text{ AM} + 7 \text{ hours} = 3 \text{ PM}$$

or 15:00

Day Wed

Time 15:00 or 3 PM



7

Work out $(43 \times 8) - (234 \div 6)$

[3 marks]

$$43 \times 8$$

40	320	320
3	24	24

$$234 \div 6$$

39
6 $\overline{) 234}$

$$\underline{\underline{344}}$$

$$(344) - (39)$$

344
39
<u>305</u>

$$\underline{\underline{305}}$$

Answer _____

305

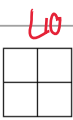



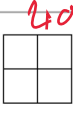
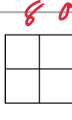
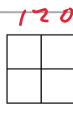
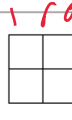
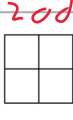
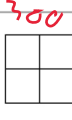
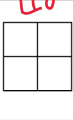
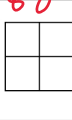
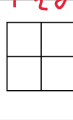
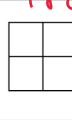
Turn over for the next question

Turn over ►



- 8 Here is some information, by ticket type, about the number of people visiting a cinema one week.

Key:  represents 40 people

Adults							140
Students							300
Children							160

- 8 (a) How many children visited the cinema?

[1 mark]

160

Answer

160

- 8 (b) How many **more** students than adults visited the cinema?

[2 marks]

$$300 - 140 = 160$$

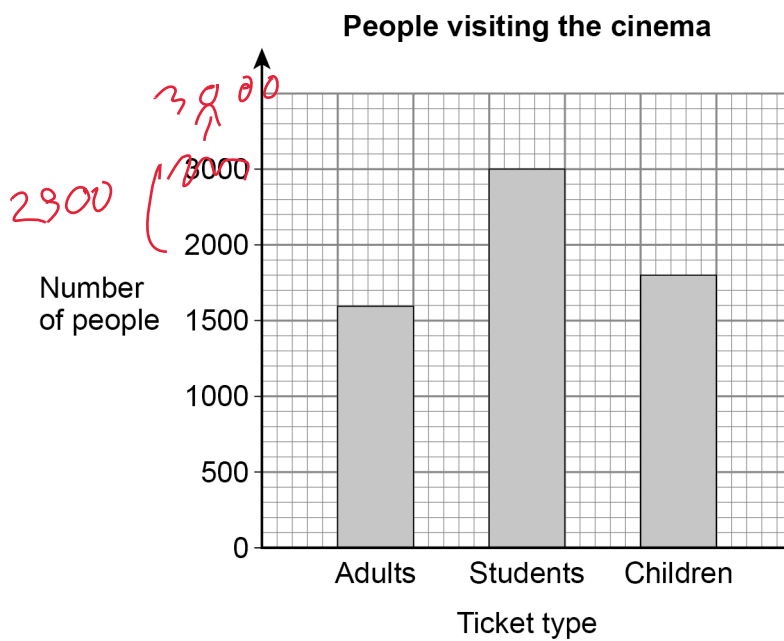
Answer

160



- 8 (c) A bar chart is drawn to show the number of people visiting the cinema one month.

Ticket type	Number of people
Adults	1600
Students	3000
Children	1800



Give **one** criticism of the bar chart.

[1 mark]

They have missed out 2500 on the scale



- 9 Harry will pay income tax if he earns more than £12500 in a year.
After 8 months he has earned a **total** of £7600
For the rest of the year he earns £1200 each month.
- Will he pay income tax?
You **must** show your working.

4 months left

$$\begin{array}{r}
 4 \times 1200 = 4800 \\
 + 7600 \\
 \hline
 \pounds 12400
 \end{array}$$

[3 marks]

He does not pay tax as he is £100 under the £12500 limit

- 10 x is a 2-digit whole number.
How many digits does the number $10x$ have?
Circle your answer.

[1 mark]

cannot tell

2

3

4

E.g.

$$\begin{array}{l}
 38 \times 10 = 380 \\
 79 \times 10 = 790 \\
 10 \times 10 = 100 \\
 99 \times 10 = 990
 \end{array}$$

3 digits



11 (a) Circle the answer to 50×0.2

[1 mark]

1

10

100

1000

$$50 \times 2 = 100$$

$$50 \times 0.2 = 10.0$$

11 (b) Work out $3.65 \div 5$

Give your answer as a decimal.

[2 marks]

$$\begin{array}{r} 0.73 \\ 5 \overline{) 3.65} \\ \underline{3} \\ 6 \\ \underline{5} \\ 15 \\ \underline{15} \\ 0 \end{array}$$

Answer

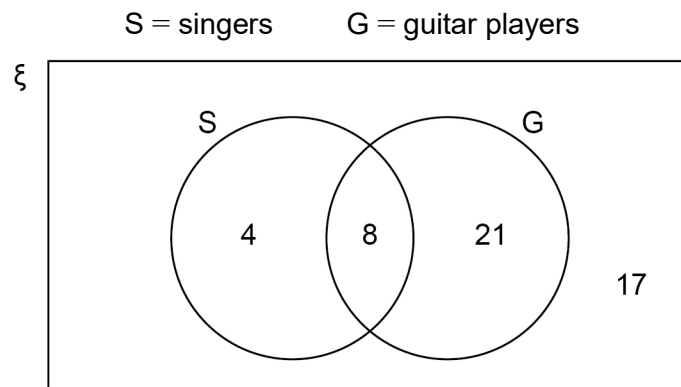
0.73

Turn over for the next question

Turn over ►



- 12 The Venn diagram shows information about 50 people who are in bands.



- 12 (a) How many of the people are guitar players?

[1 mark]

Answer 8 + 21 = 29

- 12 (b) How many of the people are singers but **not** guitar players?

[1 mark]

Answer 4

- 12 (c) One of the people is chosen at random.

Write down the probability that the person is

not a singer

and

not a guitar player.

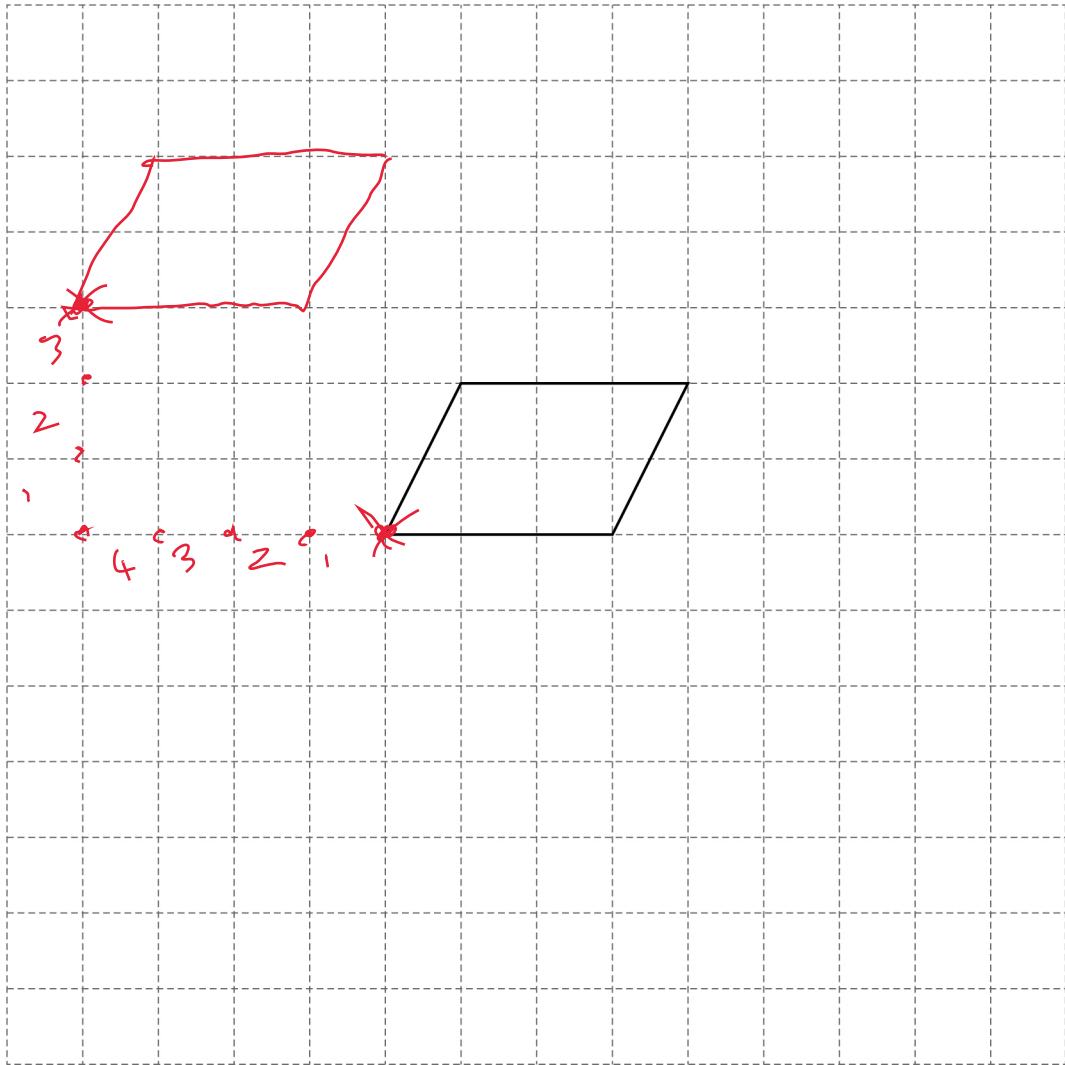
[1 mark]

Answer $\frac{17}{50}$



13

Here is a parallelogram.



The parallelogram is translated 4 squares to the left and 3 squares up.

Draw the translated parallelogram.

[2 marks]



14 (a) Solve $6x - 11 = 13$

[2 marks]

$$6x - 11 = 13$$

$$\boxed{\div 6} \leftarrow \boxed{+11} \leftarrow$$

$$24 \qquad \frac{24}{6} = 4$$

$$x = \underline{4}$$

14 (b) Simplify fully $(2 \times 4a) + 9 + \frac{15a}{3} - 7$

[3 marks]

$$\frac{15}{3} = 5$$

$$\textcircled{8a} + \overset{8a}{9} + \textcircled{5a} - 7$$

$$13a + 2$$

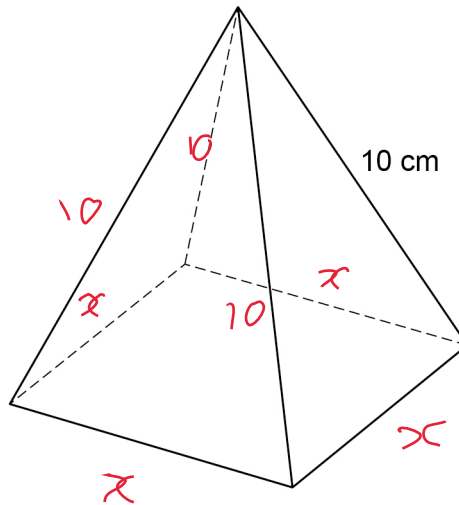
$$\text{Answer } \underline{13a + 2}$$



15

A pyramid has a square base.

Each of the four sloping edges has length 10 cm



The total length of all eight edges is 68 cm

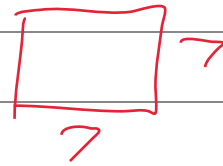
Work out the **area** of the square base.**[4 marks]**

$$68 - 40 = 28$$

$$28 \div 4 = 7$$

$$x = 7$$

$$\begin{aligned} \text{Area} &= 7 \times 7 \\ &= 49 \text{ cm}^2 \end{aligned}$$

Answer 49 cm² cm²

- 16** The table shows information about how 150 students travel to school.

	Walk	Bus	Car	
Girls	22	33	17	Total = 72
Boys	24	41	13	Total = 78

- 16 (a)** What fraction of the **girls** walk to school?
Give your answer in its simplest form.

$$\frac{22}{72} \div 2 = \frac{11}{36}$$

[2 marks]

Answer _____

- 16 (b)** One of the **boys** is chosen at random.
What is the probability that the boy travels to school by bus?

[1 mark]

Answer _____

$$\frac{41}{78}$$



16 (c) What percentage of the 150 **students** travel to school by car?

[2 marks]

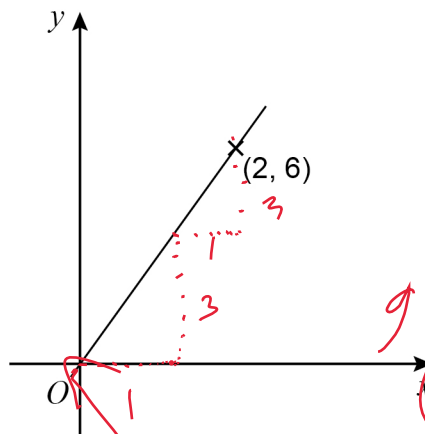
$$17 + 13 = 30 \quad \underline{30}$$

$$\underline{30} \div 3 = \underline{10} \quad \times 2 = \underline{20} \quad 150$$

$$150 \div 3 = \underline{50} \quad \times 2 = 100 = 20\%$$

Answer 20 %

17 A straight line passes through O and $(2, 6)$



gradient = 3

(1 across, 3 up)

Circle the equation of the line.

y-intercept = 0

(crosses at 0)

[1 mark]

$$y = 3x + 0$$

$$y = x + 4$$

$$y = 6$$

$$y = 3x$$

$$y = \frac{1}{3}x$$



18 (a) Work out 110% of 80

[2 marks]

$$\begin{array}{l} 100\% = 80 \\ \div 10 \\ 10\% = 8 \end{array}$$

$$110\% = 88$$

Answer _____

18 (b) Work out 21 as a fraction of 12

Circle your answer.

[1 mark]

$$\frac{7}{4}$$

$$\frac{4}{7}$$

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

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

$$\frac{21}{12} \div 3 = \frac{7}{4}$$



19 Bags X and Y each contain counters.

Bag X
30 counters
Each counter is green, white or yellow

Bag Y
5 counters
3 green and 2 red

$$P(\text{red}) = \frac{2}{5}$$

19 (a) $P(\text{green counter from X}) = P(\text{red counter from Y})$

Work out the number of green counters in X.

[2 marks]

$$\text{Bag X } P(\text{Red}) = \frac{2}{5}$$

$$\frac{2}{5} \times 30 = \frac{?}{30} = \frac{12}{30}$$

Answer _____

~~12~~ 12 greens

19 (b) All 35 counters are put into one bag.

One counter is picked at random.

Work out the probability that the counter is **not** red.

[2 marks]

$$\text{Bag X } \frac{0}{30} \text{ reds}$$

$$\text{Bag Y } \frac{2}{5} \text{ reds}$$

$$\text{Both bags } \frac{2}{35} \text{ reds so } \frac{33}{35} \text{ not reds}$$

Answer _____

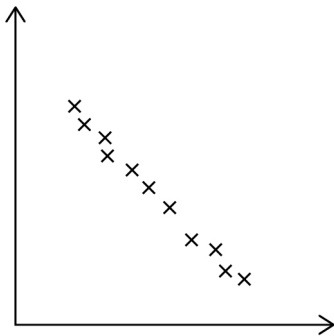
$$\frac{33}{35}$$



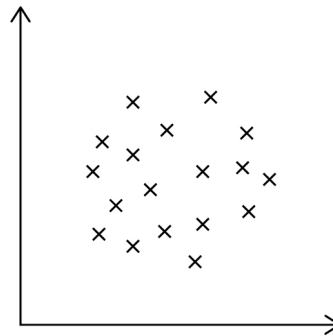
20

A and B are scatter graphs.

Graph A



Graph B



What type of correlation is shown by each graph?

Choose from

Weak positive
Strong positive
Weak negative
Strong negative
No correlation

[2 marks]

Graph A strong negativeGraph B no correlation

- 21 (a) All the terms of a **geometric** progression are positive.
The second and fourth terms are shown.

..... 2 4 8 16 $\times 2$

Work out the first and third terms.

[2 marks]

$\times 2$

First term 2

Third term 8

- 21 (b) The first two terms of an **arithmetic** progression are shown.

p $5p$
 $+4p$ $+4p$ $4p$
add on

The sum of the first three terms is 90

Work out the value of p .

[3 marks]

$15p = 90$ $\frac{90}{15} = 6$

$\boxed{\div 15}$ ←

Answer 6

7

Turn over ►



22

This formula converts temperature in degrees Fahrenheit (F) to kelvin (K)

$$K = \frac{5}{9}(F - 32) + 273$$

A pottery oven is heated to 2192 degrees Fahrenheit.

Work out this temperature in kelvin.

$$K = \frac{5}{9}(2192 - 32) + 273 \quad [3 \text{ marks}]$$

$$= \frac{5}{9}(2160) + 273$$

$$\frac{5}{9} \text{ of } 2160$$

$$9 \overline{) 2160} \quad \begin{array}{r} 240 \\ \underline{180} \\ 360 \\ \underline{360} \\ 0 \end{array}$$

240	240	240	240	240	240	240	240	240
-----	-----	-----	-----	-----	-----	-----	-----	-----

$$240 \times 5 = 1200$$

Answer 1473 kelvin

$$K = 1200 + 273 = 1473$$

23

As a decimal $\frac{11}{40} = 0.275$ Work out $\frac{33}{400}$ as a decimal.

$$\times 3 \div 10$$

$$0.275 \times 3$$

$$0.275$$

$$0.275$$

$$0.825$$

$$0.825 \div 10 = 0.0825$$

Answer 0.0825

24

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.

~~2400~~

dep

300	300	300	900
-----	-----	-----	-----

 } 2400

ment pay

250	500	500	300	300
-----	-----	-----	-----	-----

 } 1500

[4 marks] ÷ 8

$$\frac{1500}{6} = 250$$

Answer £ 250

25

Factorise fully $2x^2 + 6x$

[2 marks]

$$2x(x+3)$$

Answer $2x(x+3)$ 

26 Two wire shapes make an earring.
The shapes are
a circle with radius 21 mm
and
a quarter circle.



Not drawn accurately

Circumference
= $2\pi r$

$\leftarrow 2 \times \pi \times 21$
= 42π

$\frac{2 \times \pi \times 6}{4} = \frac{12\pi}{4}$
= 3π

total perimeter =
 $3\pi + 6 + 6 = 3\pi + 12$

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



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



26 (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 marks]

$$42\pi + 10 + 3\pi + 12$$

$$= 45\pi + 12$$

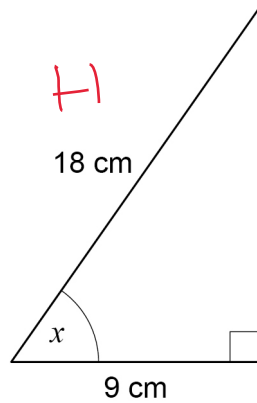
Answer 45π + 12 mm

Turn over for the next question

Turn over ►



27

Use trigonometry to work out the size of angle x .Not drawn
accurately

SOH CAHTOA

[2 marks]

$$\cos x = \frac{A}{H}$$

$$\cos x = \frac{9}{18} = \frac{1}{2}$$

$$\cos^{-1}\left(\frac{1}{2}\right) = 60^\circ$$

Answer 60 degrees



28 Rearrange $c = \frac{d+2}{3}$ to make d the subject.

[2 marks]

work backwards

$$\boxed{\times 3} \rightarrow \boxed{-2}$$

$$3c - 2$$

Answer $d = 3c - 2$

29 (a) Write 360 000 in standard form.

[1 mark]

Answer 3.6×10^5

29 (b) Write 9.2×10^{-3} as an ordinary number.

[1 mark]

Answer ~~0.0092~~ 0.0092

END OF QUESTIONS



There are no questions printed on this page

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outside the
box*

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ANSWER IN THE SPACES PROVIDED**



