

Please write clearly in block capitals.

Centre number

Candidate number

Surname _____

Forename(s) _____

Candidate signature _____



GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Tuesday 5 November 2019

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.
- 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	
26	
TOTAL	

Advice

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



Answer all questions in the spaces provided

Do not write
outside the
box

- 1 Circle the value of the digit 9 in the number 7.962

[1 mark]

$$\frac{9}{1000}$$

$$\frac{9}{100}$$

$$\frac{9}{10}$$

9

- 2 Solve $3x = 6$

Circle your answer.

[1 mark]

$$x = 0.5$$

$$x = 2$$

$$x = 3$$

$$x = 18$$

- 3 Circle the correct statement.

$$\frac{1}{4} = 0.25$$

[1 mark]

$$0.3 > \frac{1}{4}$$

$$0.3 = \frac{1}{4}$$

$$0.3 \leq \frac{1}{4}$$

$$0.3 < \frac{1}{4}$$



4 Circle the number that is closest in value to $\sqrt{50}$

$$\sqrt{49} = 7$$

[1 mark]

5

7

8

25

5 Work out 76×24

[3 marks]

$$\begin{array}{r}
 \cancel{7} \\
 76 \\
 \hline
 24 \times \\
 \hline
 304 \\
 1520 + \\
 \hline
 1824
 \end{array}$$

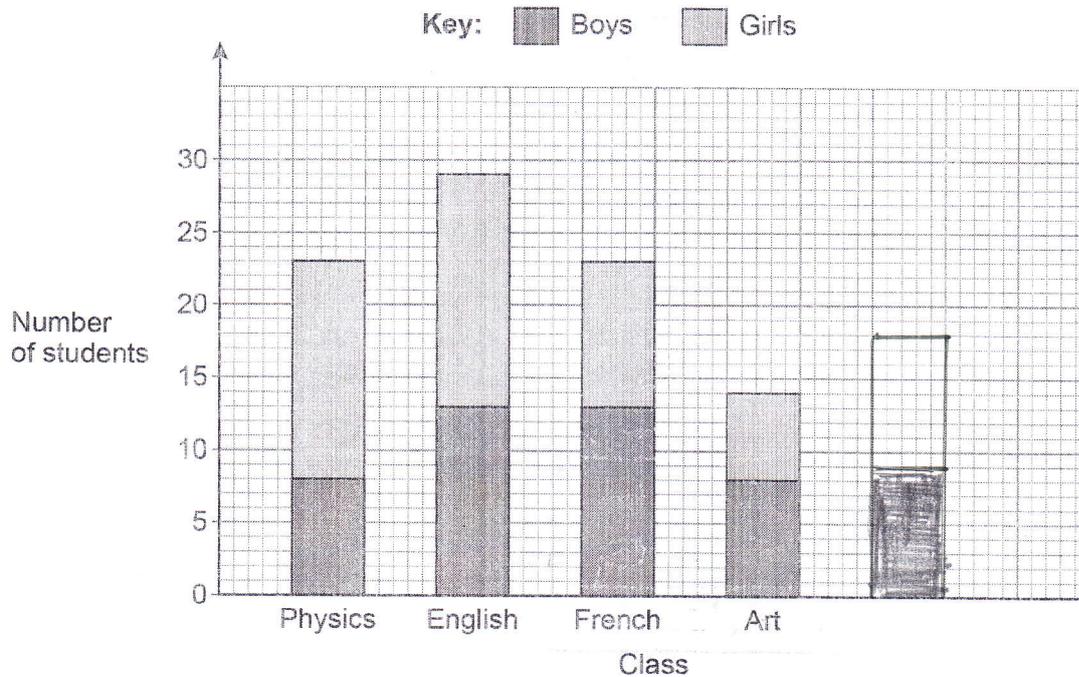
Answer 1824

7

Turn over ►



- 6 The composite bar chart shows the number of students in some classes.



- 6 (a) How many boys are in the Physics class?

[1 mark]

Answer 8

- 6 (b) How many girls are in the English class?

[1 mark]

$29 - 13 = 16$

Answer 16

- 6 (c) Which two classes have the same total number of students?

[1 mark]

Answer Physics and French



- 6 (d) In the History class
there are 18 students
number of boys = number of girls

Show this information on the bar chart.

[2 marks]

$$9 + 9 = 18$$

- 7 (a) Work out $1.86 \div 6$

$$\begin{array}{r} 0.31 \\ 6 \overline{) 1.86} \end{array}$$

[1 mark]

Answer 0.31

- 7 (b) Work out 0.4×0.2

$$4 \times 2 = 8$$

[1 mark]

Answer 0.08



8 Here are four number cards.

8.6

0.27

6.3

0.4

- 8 (a) Choose two of the cards to make the answer to this calculation a whole number.
Include the answer to the calculation.

[2 marks]

$$\boxed{8.6} + \boxed{0.4} = \underline{9}$$

- 8 (b) Choose two of the cards to make the answer to this calculation as large as possible.
Include the answer to the calculation.

[2 marks]

$$\boxed{8.6} - \boxed{0.27} = \underline{8.33}$$

$$\begin{array}{r} \text{5.} \\ 8. \cancel{60} \\ 0.27 - \\ \hline 8.33 \end{array}$$



9

Rulers
85p each

Pens
£3.50 each

Jenny buys 5 rulers and 2 pens.
She works out how much she should pay.

$$5 \times 85p = \text{£}4.25 \quad \checkmark$$

$$2 \times \text{£}3.50 = \text{£}6.10 \quad \leftarrow \text{wrong}$$

$$\text{Total} = \text{£}10.35$$

$$\begin{array}{r} 2 \\ 85 \\ \hline 5 \times \\ \hline 425 \end{array}$$

Jenny's total is wrong.

What mistake has she made?

Include the correct total in your answer.

[2 marks]

Mistake made $2 \times \text{£}3.50 = \text{£}7$

$4.25 + 7$

Correct total £ 11.25

Turn over for the next question

6

Turn over ►



10

Here are three calculations, A, B and C.

A	B	C
$100 \times 20\,000$	$1 \text{ million} \div 2$	$4 \times 100\,000$
<u>2 000 000</u>	<u>500 000</u>	<u>400 000</u>

Put the calculations in order.

Start with the calculation that has the smallest answer.You **must** show the answer to each calculation.**[3 marks]**

$$A = 2\,000\,000$$

$$B = 500\,000$$

$$C = 400\,000$$

Smallest C B Largest A 

- 11 In a raffle, 200 tickets are sold.
The tickets are either red or blue.
The winning ticket is picked at random.

- 11 (a) What is the probability that the winning ticket is green?

[1 mark]

Answer 0

- 11 (b) 79 children and 90 women buy one ticket each.
Men buy the rest of the tickets.

Work out the probability that a man buys the winning ticket.

[2 marks]

$$\begin{array}{r} 79 \\ 90 \\ \hline 169 \end{array} \quad \begin{array}{r} 200 \\ 169 \\ \hline 31 \end{array}$$

Answer $\frac{31}{200}$

Turn over for the next question

Turn over ►



12

A college has

a total of 105 teachers19 more female teachers than male teachers.

What proportion of the teachers are female?

[3 marks]

$$x + x + 19 = 105$$

$$2x + 19 = 105$$

$$2x = 105 - 19$$

$$2x = 86$$

$$x = 43$$

$$\therefore \text{female} = 19 + 43$$

$$\text{Answer } \frac{62}{105}$$

$$\begin{array}{r} 09 \\ 105 \\ 19- \\ \hline 86 \end{array}$$

$$\begin{array}{r} 19 \\ 43 \\ \hline 62 \end{array}$$

13

By rounding each number to the nearest 10, estimate the value of $262 \div 19.8$

[2 marks]

$$260 \div 20$$

$$\text{Answer } 13$$



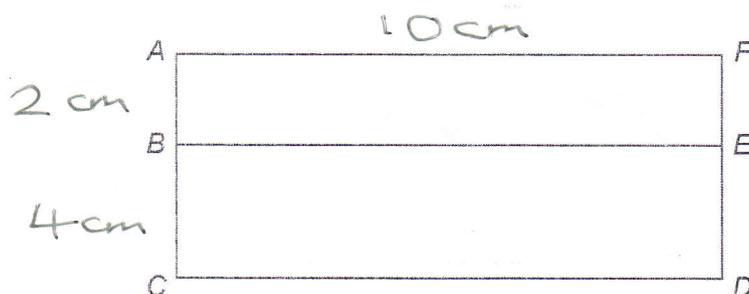
14

 $ABEF$ and $ACDF$ are rectangles.

$AF = 10 \text{ cm}$

$AB = 2 \text{ cm}$

$BC = 4 \text{ cm}$

Not drawn
accurately

Work out

perimeter $ABEF$: perimeter $ACDF$

Give your answer in its simplest form.

[3 marks]

$$ABEF = 10 \times 2 + 2 \times 2 = 24$$

$$ACDF = 10 \times 2 + 6 \times 2 = 32$$

$$24 : 32$$

$$3 : 4$$

Answer 3 : 4

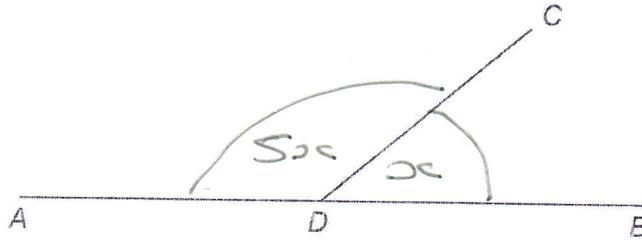
Turn over for the next question

Turn over ►



15

ADB and CD are straight lines.

Not drawn
accuratelyangle $ADC = 5 \times$ angle CDB Work out the size of angle ADC .

[3 marks]

$$6x = 180$$

$$x = 30$$

$$5x = 150$$

Answer 150 degrees

16

Circle the value of 5^3 .

$$5 \times 5 \times 5 = 125$$

[1 mark]

8

15

25

125



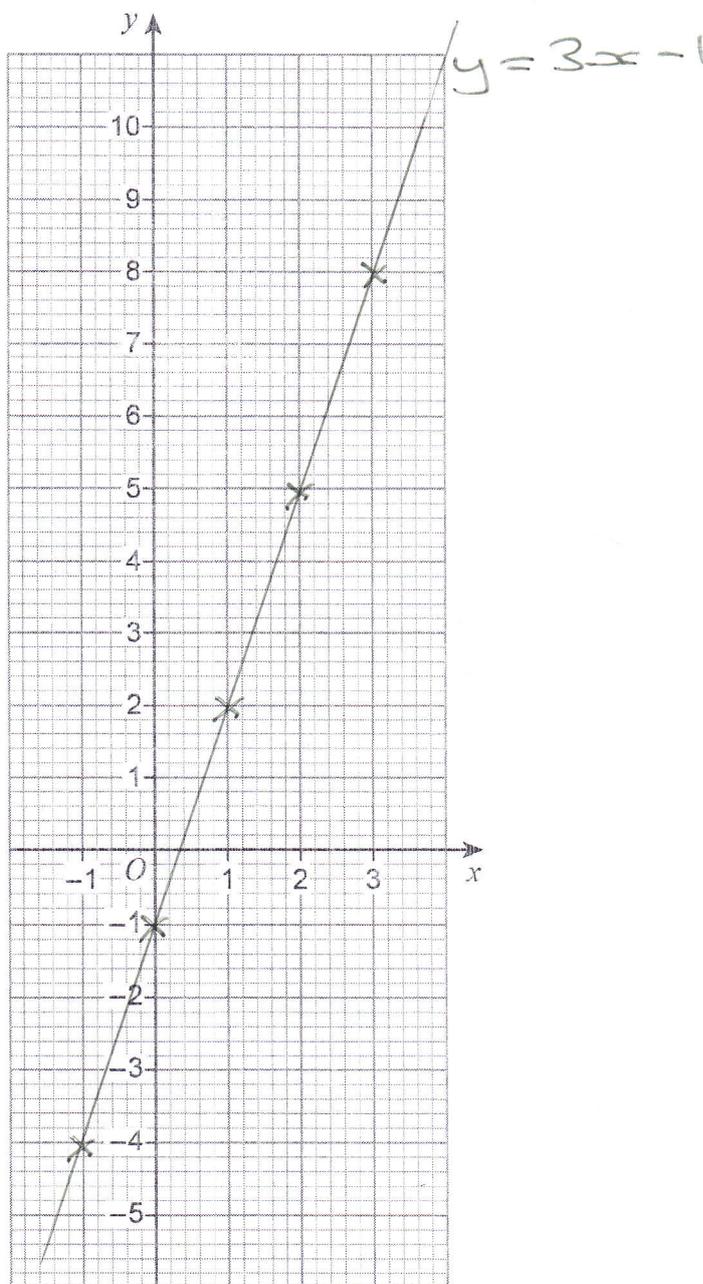
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17

Draw the graph of $y = 3x - 1$ for values of x from -1 to 3

[3 marks]

x	-1	0	1	2	3	4
y	-4	-1	2	5	8	



7

Turn over ►



- 18 Mo played 30 games of chess.
He won 18 of these games.

- 18 (a) What fraction of the games did he win?
Give your answer in its simplest form.

$$\frac{18}{30} \stackrel{(\div 6)}{=} \frac{3}{5}$$

[2 marks]

Answer $\frac{3}{5}$

- 18 (b) He played 20 more games.
He had then won 64% of **all** of his games.
How many of the 20 games did he win?

[3 marks]

$$20 + 30 = 50 \text{ games}$$

$$\frac{64}{100} \times 50 = 32 \text{ games won}$$

$$32 - 18 = 14$$

Answer 14



19 (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 mark]

There could be 20 sheep
and 6 cows

19 (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 mark]

$13 \div 4 = 3\frac{1}{4}$ which is
more than 3



20

An ordinary fair dice is rolled.

$$P(A) = \frac{5}{6}$$

Which could be a correct statement about event A?

Tick **one** box.

[1 mark]

The number rolled is even

The number rolled is greater than 1

The number rolled is less than 5

The number rolled is prime

21

Solve $8x + 7 = 2x + 10$

[3 marks]

$$8x - 2x = 10 - 7$$

$$6x = 3$$

$$x = \frac{3}{6} = \frac{1}{2}$$

$$x = \frac{1}{2}$$



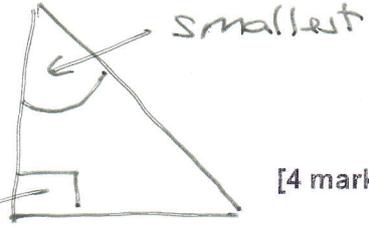
22

In a right-angled triangle

smallest angle : largest angle = 2 : 5

Work out the three angles of the triangle.

largest



[4 marks]

$$2 : 5 \quad \times 18$$

$$90 \quad \times 18$$

$$18$$

$$\frac{90}{5} = 18$$

$$2 \times 18 = 36^\circ \quad (\text{smallest})$$

$$90 - 36 = 54^\circ \quad (\text{middle})$$

36

degrees

54

degrees

90

degrees

23

Which one of the following is discrete data?

Circle your answer.

[1 mark]

length of arm

height of door

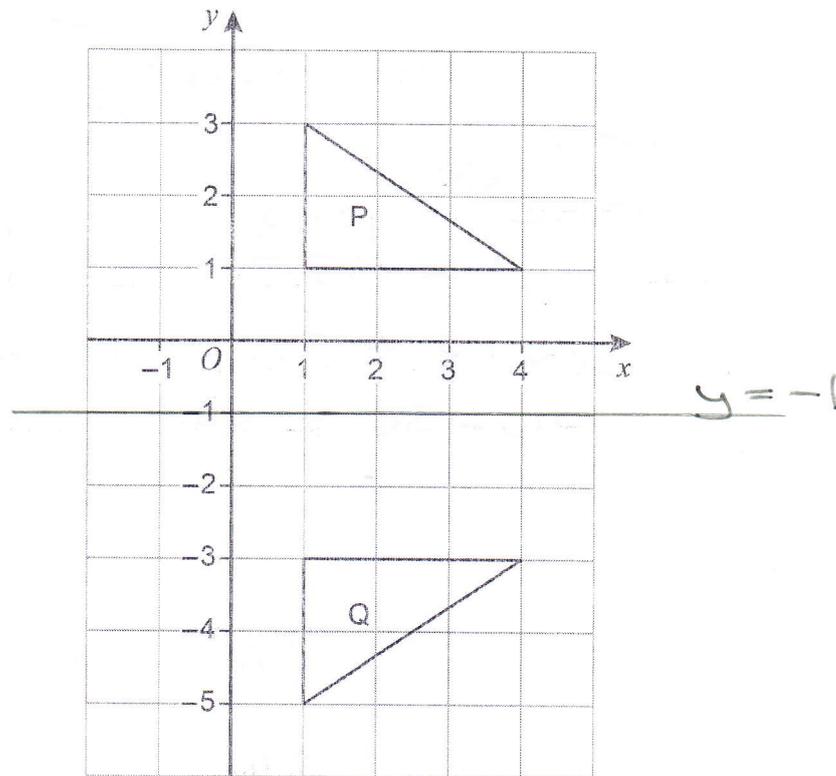
number of pets

mass of sugar

Turn over ►



24 (a) Here are two triangles, P and Q.



Here is a statement.

A transformation that maps P to Q is a reflection in the line $x = -1$

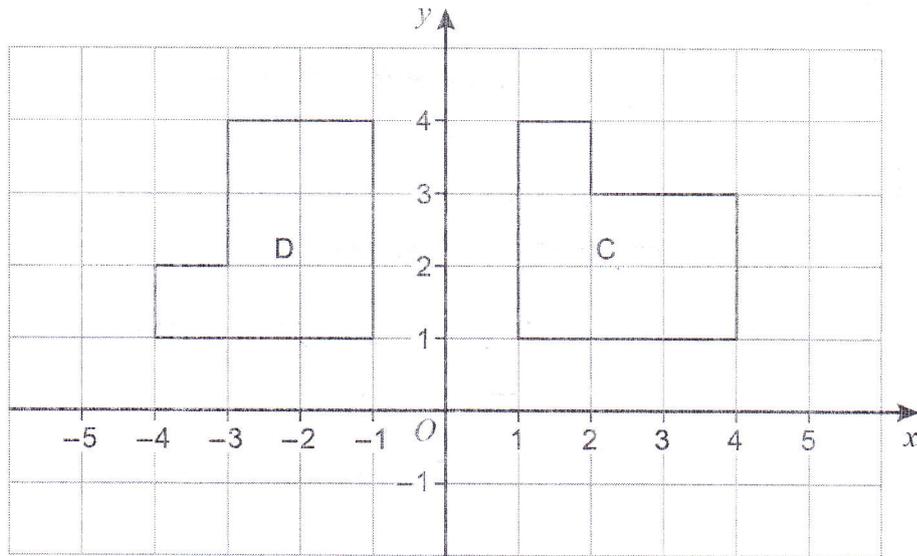
Make **one** criticism of the statement.

[1 mark]

Should be reflection in line
 $y = -1$



24 (b) Here are two shapes, C and D.



Here is a statement.

A transformation that maps C to D is a rotation through 90° anticlockwise.

Make one criticism of the statement.

[1 mark]

Should say that the centre
of rotation is (0, 0)

Turn over for the next question

Turn over ►



25 (a) A geometric progression starts 4 16

Work out the next term.

$\times 4$

[1 mark]

$$16 \times 4 = 64$$

Answer 64

25 (b) A Fibonacci-type sequence starts 3 -8

The sequence is continued by adding the previous two terms.

Work out the next two terms.

[2 marks]

$$3 - 8 = -5$$

$$-8 - 5 = -13$$

Answer -5 and -13



26

Given that $a \times 60 = b$ work out the value of $\frac{4b}{a}$

[2 marks]

$$60 = \frac{b}{a} \quad \therefore \quad 4 \times 60$$

$$= 240$$

Answer 240

27

Write $27 \times (3^2)^7$ as a single power of 3

[3 marks]

$$3^3 \times 3^{14} = 3^{17}$$

Answer 3^{17}

Turn over for the next question

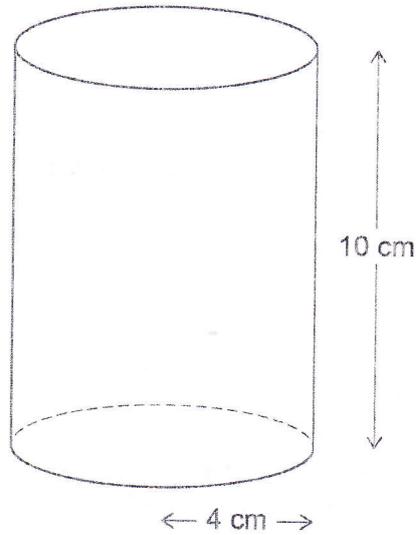


28

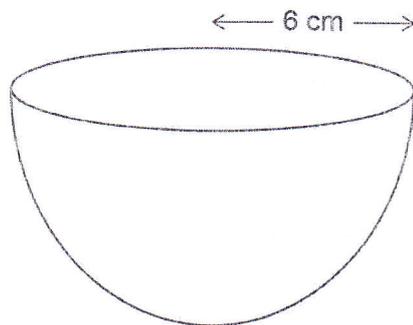
Here are two solids.

Do not write
outside the
box**Cylinder**

radius 4 cm height 10 cm

**Hemisphere**

radius 6 cm



volume of a hemisphere = $\frac{2}{3} \pi r^3$ where r is the radius



Which solid has the greater volume?

You **must** show your working.

[4 marks]

$$\text{Cylinder} = \pi \times 4^2 \times 10 = 160\pi \text{ cm}^3$$

$$\text{Hemisphere} = \frac{1}{2} \times \frac{4}{3} \times \pi \times 6^3$$

$$= \frac{2}{3} \times 216\pi$$

$$= 2 \times 72\pi$$

$$= 144\pi \text{ cm}^3$$

$$= 144\pi \text{ cm}^3$$

$$\begin{array}{r} 36 \\ 6 \times \\ \hline 216 \end{array}$$

Answer

Cylinder

Turn over for the next question



29

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.

[4 marks]

Rose Pink

R : W 60L $60 \div 3 = 20$

1 : 2

20 : 40

↓ ↓

+ 80 28

100 : 68

50 : 34

25 : 17

as this ratio
is not 4 : 3

it is not

Cherry Pink



30 (a) Work out $\frac{2 \times 10^{14}}{8 \times 10^9}$

$$2 \div 8 = \frac{1}{4} = 0.25$$

$$10^{14} \div 10^9 = 10^5$$

Give your answer in standard form.

[2 marks]

$$0.25 \times 10^5$$

$$\times 10 \quad \div 10$$

$$2.5 \times 10^4$$

Answer 2.5×10^4

30 (b) $6200.07 = 6.2 \times 10^c + 7 \times 10^d$

Work out the values of c and d .

[2 marks]

$$6200 = 6.2 \times 10^3$$

$$0.07 = 7 \times 10^{-2}$$

$c = 3$ $d = -2$

Turn over for the next question



31

$$V = \frac{k}{H} \quad \text{where } k \text{ is a constant.}$$

Which two statements are correct?

Tick two boxes.

[1 mark]

V is directly proportional to H

V is inversely proportional to H

V is directly proportional to $\frac{1}{H}$

V is inversely proportional to $\frac{1}{H}$

END OF QUESTIONS

1

