



Class VIII Common Examination

INDEX NUMBER :

STUDENT NAME :

SCHOOL NAME :

Do not mutilate, fold or put any mark over the barcode

Supervising Examiner / Invigilator's Initial

FOR OFFICIAL USE ONLY

Reading Time: 15 Minutes

Writing Time: 2 Hours

Full Marks: 80

Year: 2022

Mathematics

Administrative No.

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For Marker's USE only							
Section	Question	Full Marks	Award	Marker Initial	Cross Checker Initial	Change, if any	Marker Initial
A							
B							
		TOTAL		Chief Marker's Initial			Chief Marker's initial

IMPORTANT: Turn over to read instructions.

READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. **Do not** write for the first **fifteen minutes**. This time is to be spent on reading the questions. After having read the questions, you will be given **two hours** to answer all the questions.
2. In this paper, there are two sections: **A** and **B**. All the questions in this paper are **compulsory**.
3. **Read and re-read carefully** to understand the **instructions and questions** before answering them.
4. **Writing neatly and clearly** will always go well in **your favor!** If your writing cannot be read – **marks can't be awarded**.
5. **Do not** remove or tear off any page from the booklet.
6. **Do not** draw lines or pictures on or in the booklet unless specified by the questions. **Marks can be deducted** for any **Not-Called-For** scribbling, sketching, commenting etc. written in your answer booklet.
7. **Do not** leave the examination hall before you have made sure that you have answered all the questions.
8. The cover page has **BARCODE**. **Do not** mutilate, fold or put any mark on them. **DO NOT** remove the cover page from the booklet. If you do so, your answers will not be evaluated.
9. **Measurmement formula** and Relationship are given in the last page of this booklet.

SECTION A [30 Marks]

Question 1

[30]

Direction: For each question, there are FOUR responses: A, B, C and D. Choose the correct alternative and circle it. DO not circle more than one alternative. If there are more than ONE choice circled, NO score will be awarded.

i. A shop sells tin fish packed in various sizes at different prices as shown in the table.

Tin (g)	Price (Nu)
Tin 1 (400g)	20
Tin 2 (600g)	30
Tin 3 (250g)	10
Tin 4 (450g)	25

Which tin fish cost the least per gram?

- A Tin 1
- B Tin 2
- C Tin 3
- D Tin 4

ii. Dawa's garden has an area of 81m^2 . He wants to fence one of the sides using wire mesh. Which of the following is the correct length of the wire?

- A 9 m
- B 18 m
- C 36 m
- D 54 m

iii. $(-2) \times 4 = 4 \times (-2)$. What property of grouping of factors is shown?

- A closure
- B associative
- C distributive
- D commutative

iv. A teacher writes the number and its scientific notation in the table given below.

Number	Scientific notation
0.13789	1.3789×10^1
520000	5.2×10^4
231.546	2.31456×10^{-2}
17	17×10^0

Which scientific notation is correct?

- A 1.3789×10^1
- B 5.2×10^4
- C 2.3145×10^{-2}
- D 7×10^0

v. A USB drive can hold 16 gigabytes of data. If Pema's video used 12 gigabytes of its memory, what percent of the memory has been used.

- A 25%
- B 45%
- C 55%
- D 75%

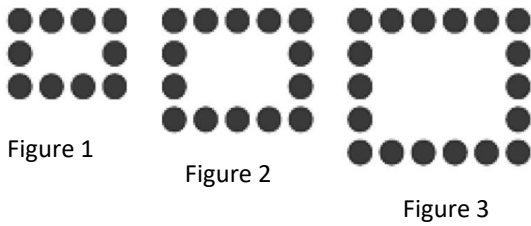
vi. The table below shows the price of a mobile phone on sale with the different discount amounts.

Shop	Selling Price (Nu)	Discount
1	15000	25%
2	15000	$\frac{1}{2}$ of the price
3	15000	30%
4	15000	Nu 5000

Which shop offers the best discount for the mobile phone?

- A Shop 1
- B Shop 2
- C Shop 3
- D Shop 4

vii. Look at the pattern in the figure given below.



Which equation describes the relationship between the figure number (f) and the number of dots (d) in each figure?

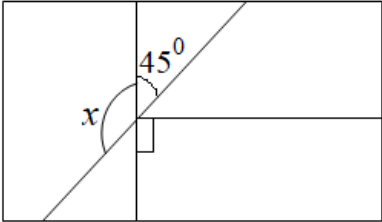
- A $d = 4f + 18$
- B $d = 4f + 14$
- C $d = 4f + 10$
- D $d = 4f + 6$

viii. Which model below best represent the solution for $(4 \times - 4) - (2 \times + 2)$?

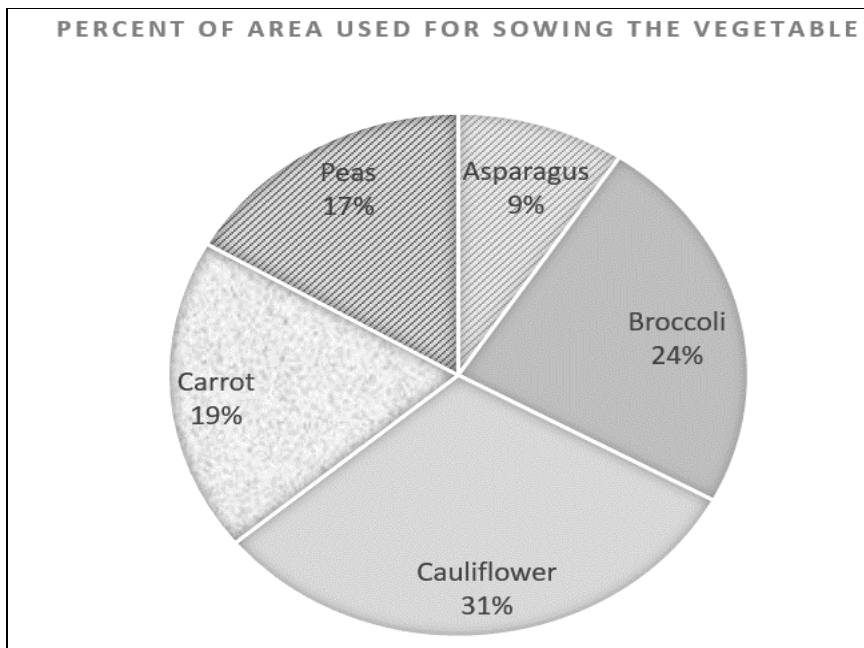
- A ■ ■ ■ ■ ■ ■
- B □ □ □ □ □ □
- C ■ ■
- D □ □

ix. Jigme wants to send pocket story books as a gift to his friends. He wants to pack the books in a box of length 40cm, breadth 20 cm and height 20cm. Each diary has a length of 8cm, breadth 5cm and height 4cm. How many diary books can he send?

- A 100 books
- B 160 books
- C 200 books
- D 400 books

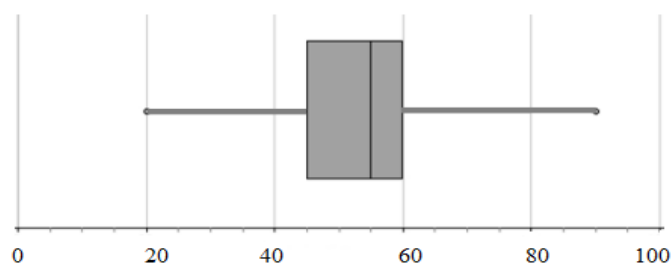
<p>x. Which one of the following is not true about angles with parallel and intersecting lines?</p> <p>A interior angles are supplementary</p> <p>B corresponding angles are equal</p> <p>C adjacent angles add to 360°</p> <p>D alternate angles are equal</p>	
<p>xi. The length and width of the television screen measures 80cm by 40cm. Which of the following dimensions have the same perimeter as that of the television screen?</p> <p>A 60cm by 40cm</p> <p>B 60cm by 50cm</p> <p>C 70cm by 50cm</p> <p>D 70cm by 60cm</p>	
<p>xii. Study the diagram given below and find the value of angle 'x'.</p>  <p>A 45°</p> <p>B 90°</p> <p>C 105°</p> <p>D 135°</p>	
<p>xiii. Tandin visited Lhaxhang to predict his examination result. He rolled a die twice. What is the probability of getting a sum more than 8?</p> <p>A $\frac{5}{12}$</p> <p>B $\frac{7}{12}$</p> <p>C $\frac{5}{18}$</p> <p>D $\frac{13}{18}$</p>	

- xiv. As per the survey carried out by Ministry of Agriculture and Forest in 2019, 2819.74 acre of land in Bhutan was used for sowing varieties of vegetables as shown in the figure below.



What acre of the land was used to cultivate carrot?

- A 148.82 acre
 - B 535.75 acre
 - C 874.11 acre
 - D 2819.74 acre
- xv. The box-and-whisker plot below displays the Mathematics marks scored by the students of class VIII.



What is the median mark?

- A 20
- B 45
- C 55
- D 60

SECTION B [50 MARKS]

Question 2

a. Write 0.57 in scientific notation.

[2]

The table below shows the speed of sound in air and water.

Medium	Speed in (metre/second)
Air	3.31×10^2
Water	1.480×10^3

[3]

In which medium is the speed of sound faster? What is the difference in speed?

Question 3

- a. A farmer borrowed money from two banks to start a farming business as shown in the table given below. [3]

Bank	Annual Interest Rate (%)	Principal (Nu)	Loan Time (years)
BDBL	10.25%	45,000	3
BOB	10.85%	60,000	2

- i. What is the total amount he has to pay to each bank at the end of their term period?
- ii. Which bank would you suggest him to borrow money in the future? Explain your answer.

- b. A school is organizing a cultural programme at the end of the year. For a Dzongkha dance, 48 students volunteered. The ratio of boys to girls is 10 to 14. How many girls will not participate in the Dzongkhag dance, if the required ratio of boys to girls is 1 to 1? [2]

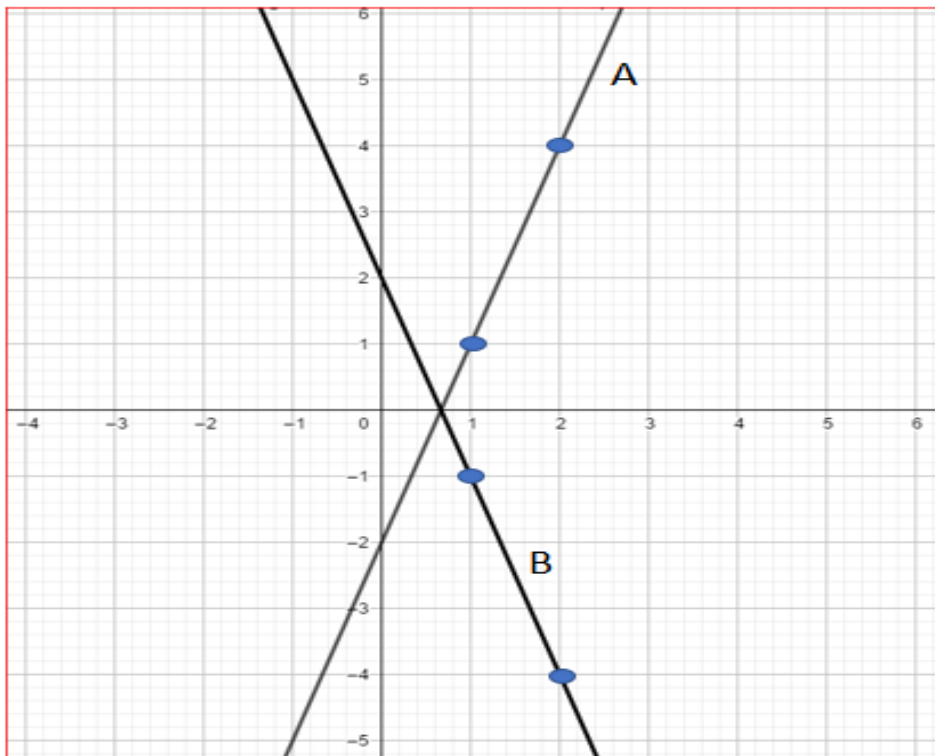
Question 4		
a.	Wangmo multiplied $4 \times (-3)$ symbolically and got 12 as a product which is not correct. Help her to multiply correctly using any strategies.	[1]
b.	Dhendup and his friends need $1\frac{1}{4}$ buckets of paint to white wash one side of a temple's wall. How much paint will they need to paint one fifth of the same wall?	[2]
c.	Evaluate the expression given below. $9.5 - [3.2 + 5.7 \times 4.1] + (-6.1)$	[2]

Question 5

Deki has 5 pencil bags. Each pencil bag has the same number of pencils. She received 3 more pencils as a birthday gift from her friend. In total there are 23 pencils. How many pencils were there in each bag initially?

[2]

a. Study the graph given below and answer the questions that follow.

[3]

i. What is the slope of A?

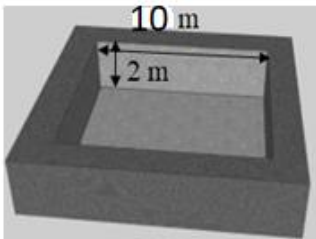
ii. Which line has a negative slope?

Question 6

a. Yangchen has two children. She divides a rectangular chocolate bar measuring 12 cm by 9 cm equally between her children. What is the length of the diagonal side of the chocolate bar?

[3]

b. A hotel has a square swimming pool which is 10m long and 2m deep as shown below. ($1\text{m}^3 = 1000\text{L}$).

[2]

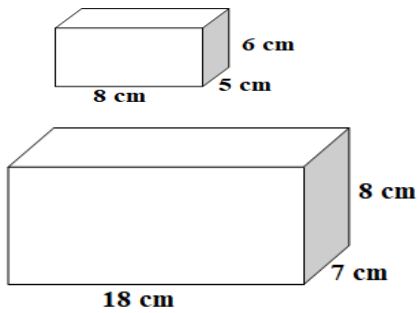
How many litres of water will fill the pool?

Question 7

a. Maya drew two different rectangles having the same area. Do you think the perimeter of both rectangles are the same? Justify with an example.

[2]

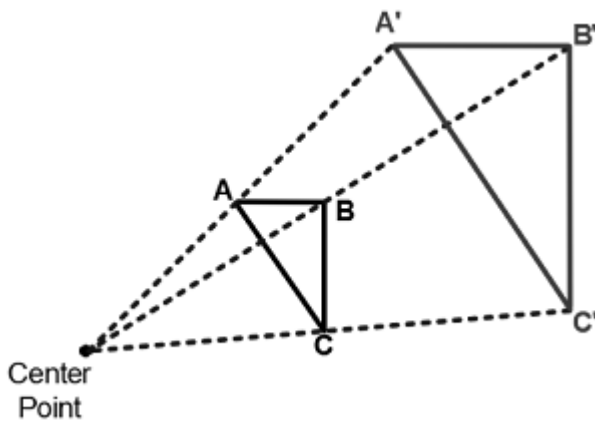
- b. Kinley want to puts a small box measuring 8cm long, 6cm wide and 5cm tall into a larger box measuring 18cm long, 7cm wide and 8cm tall as shown below. [3]



How much space is left inside the larger box?

Question 8

- a. Jigme drew a triangle ABC and transformed it to a triangle A'B'C' as shown below. [3]



- What type of transformation did he use?
- Jigme says that the above transformation has a scale factor of $\frac{1}{2}$. Do you agree? Justify your answer.

b. Look at the figure below and write the sequence of transformations from figure A to Figure C? [2]

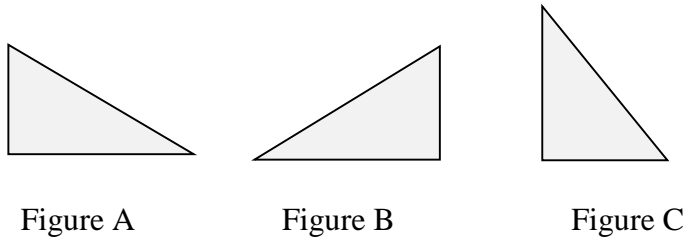
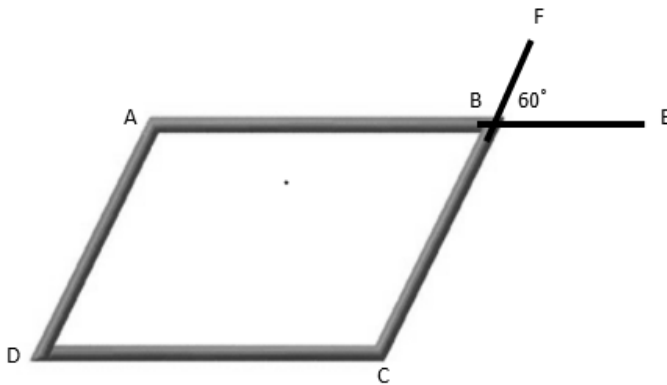


Figure	Transformation
Figure A - Figure B
Figure B - Figure C

Question 9

a. Use the diagram below to answer the question number a to c. [3]



i. Find the following angles without measuring it. Give reason for each.

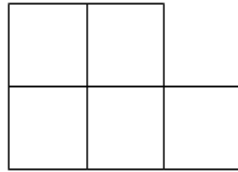
	Value of angle	Reason
a. ABD		
b. DCB		
c. ADC		

b. Thinley constructed the back view and right view of the given figure as shown below.

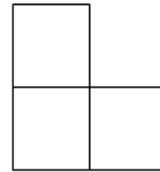
[2]



Front



Back view



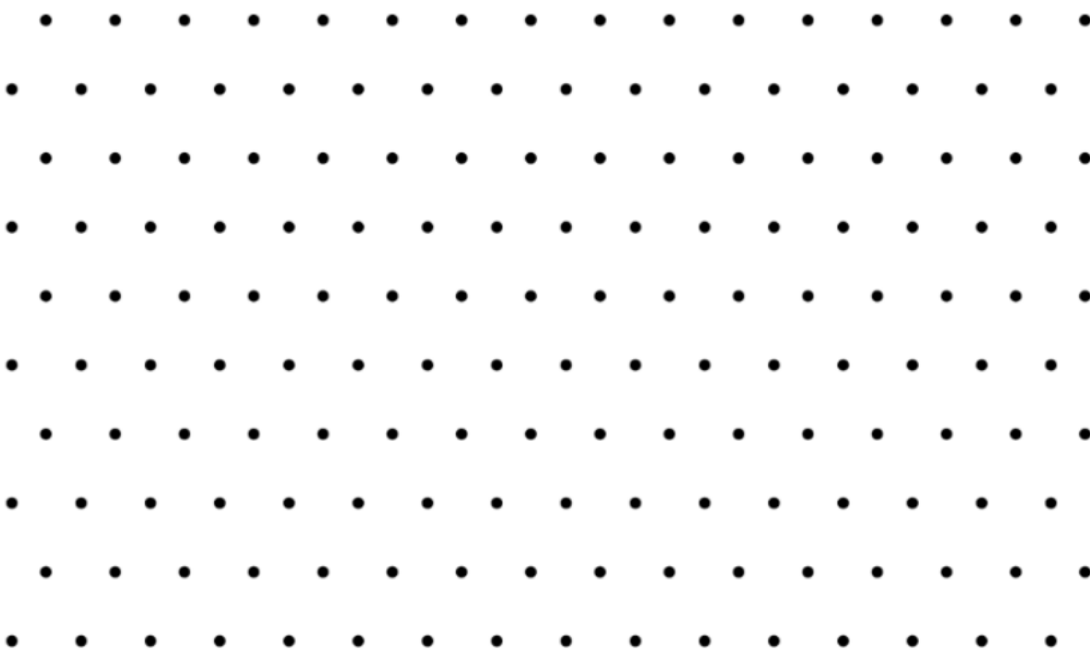
Right view

Do you think he drew the orthographic face views of the figure correctly?
Justify your answer.

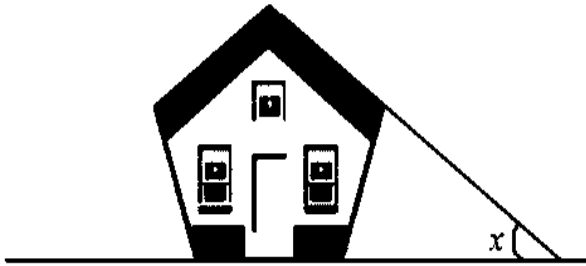
Question 10

a. Create any structure of your choice using 10 cubes. Then model your structure on the isometric dot paper given below.

[3]



- b. Sonam pitched a regular pentagon tent and tied one of the vertices to the ground as shown below. Find the value of angle x .



[2]

Question 11

- a. Based on the Climate Change Knowledge Portal, the average rainfall in Bhutan from 1999-2020 is recorded as shown in the table below.

Monthly average rainfall in Bhutan	
Month	Rainfall (millimetre)
January	10.0
February	12.0
March	35.0
April	110.0
May	220.0
June	386.0
July	449.0
August	344.0
September	234.0
October	84.0
November	9.0
December	4.0

[3]

- i. Create a scatter plot to display this set of data in the grid given below. [Use a scale of 1cm equal to 50 mm of rainfall]



- ii. In which month Bhutan received the heaviest rainfall?

- iii. What conclusion can you draw from the graph?

- b. Pema wants to conduct a survey on reading problem faced by the students in his school. He plans to use random sampling from one class to collect the data. Do you think his plan is appropriate? Explain.

Measurement formula and Relationship

Area

- Rectangle = $l \times w$
- Square = s^2
- Parallelogram = $b \times h$
- Triangle = $\frac{1}{2} \times bh$
- Trapezoid = $\frac{1}{2} \times h \times (a+b)$
- Circle $A = \pi r^2$
- rectangular prism = $2(h \times l + l \times w + w \times h)$

Volume

- Rectangular prism = area of base \times height

Perimeter and circumference

- Rectangle = $2(l + w)$
- Square = $4s$
- Circle = $2\pi r$

Pythagorean Theorem

$C^2 = a^2 + b^2$ (c: hypotenuse side, a and b are other sides of a right triangle)

ROUGH WORK