SECTION A (30 Marks)
ATTEMPT ALL QUESTIONS

Question 1 **[30]**

Direction: For e*ach 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. Tshering wants to solve a mathematical expression consisting of several operations. Which sequence below should she follow?

A Bracket-Division-Subtraction-Multiplication

B Bracket-Division-Multiplication-Subtraction

C Multiplication-Division-Bracket-Subtraction

D Subtraction-Multiplication-Division-Bracket

ii. The distance between the Earth and the Sun is 151,350,000 km.
Which measurement below best represents the distance in scientific notation?

A 1.5135×10^{-8}km

B 1.5135×10^{-4}km

C 1.5135×10^{4}km

D 1.5135×10^{8} km

iii. Karma has these cards with numbers on them. She must use each card only once to form a largest **five-digit even** number.

6	8	2	9	7	5

What is her number?

A 98765

B 98762

C 98756

D 68297

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iv. In a school there are 441 students. The school sport's instructor wants to arrange the students in such a manner that the number of **rows and columns are equal** to conduct an aerobic. How many rows and columns can be made?

A 11

B 20

C 21

D 41

v. Paint comes in 5 liter cans. The principal needs 43 liters of paint to repaint the school. How many cans must he buy?

A 7

B 8

C 9

D 10

vi. The table below shows interest rate offered by different banks in Bhutan.

Bank	Interest rate (per year)
BOBL	5%
BDBL	5.65 %
T-BANK	5.90%

Sagar deposits Nu 2500 in BOBL. How much interest will he earn at the end of **two** years?

A Nu 125

B Nu 250

C Nu 282

D Nu 500

vii. There are 36 students in a class. **One third** of classes bring lunch and **one half** of them order lunch each day. How many of them eat lunch each day?

A 30

B 18

C 12

D 6

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viii. Gaylek and Namgyel were playing a game. They both started with **zero** points. Gaylek's final score was 240 points. Namgay's final score was - 60. How many **more** points did Gaylek have than Namgyel?

A -300

B -180

C 180

D 300

ix. The table below shows a sequence of numbers.

Term	Term value
1	4
2	16
3	28
4	40
5	?

What is the next term value?

A 64

B 56

C 52

D 44

x. An athlete ran the same distance on his first day and second day. On his third day, he ran 4 times the distance that he ran on the first day. On his fourth day, he ran 8km. He ran 40km altogether. Which equation below best represents this situation?

A $14x = 40$

B $6x + 8 = 40$

C $6x = 40 + 8$

D $x + x + 4x - 8 = 40$

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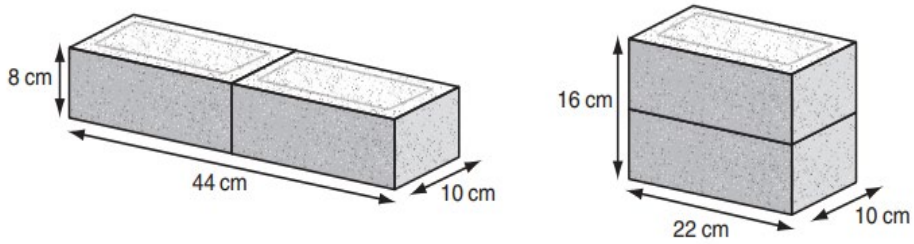
xi. Two bricks can be placed together face-to-face to form three different rectangular prisms. Two of them are shown here.



What would be the measurements of the third prism?

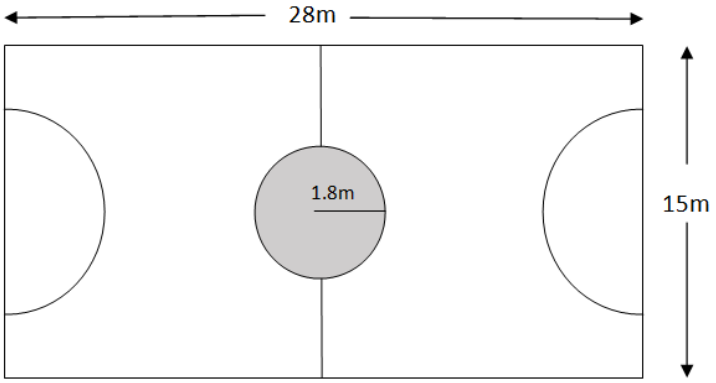
A 11cm by 16 cm by 10 cm

B 22 cm by 20 cm by 8 cm

C 32 cm by 22 cm by 10 cm

D 44 cm by 16 cm by 5 cm

xii. The diagram below a shows basketball court of a school with a circular region in the centre being painted. What is the area of the unpainted region in the **nearest whole number**?



A $10m^2$

B $86m^2$

C $410m^2$

D $420m^2$

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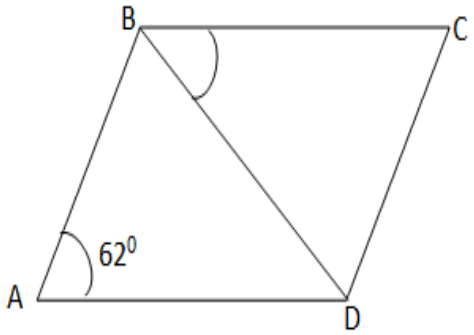
xiii. ABCD is a polygon with AB **parallel** to DC and AB = BC= BD.



Find ∠DBC.

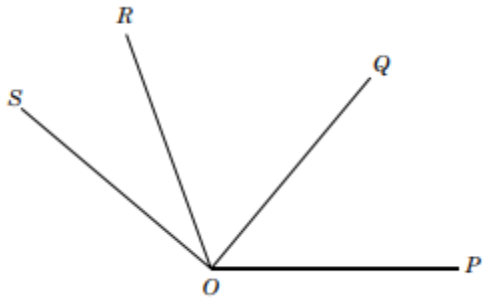
A 56°

B 59°

C 62°

D 68°

xiv. In the figure, the measure of ∠POR is 110°, the measure of ∠QOS is 90°, and the measure of ∠POS is 140°.



What is the measure of ∠QOR?

A 20^0

B 30^0

C 50^0

D 60^0

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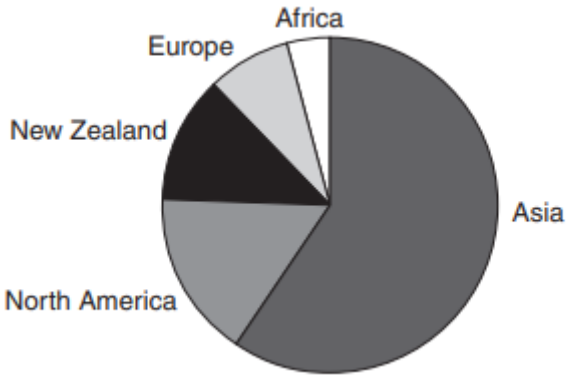
xv. An airline is a company that offers regular services for transporting passengers or goods via flight. The diagram shows the proportion of flights to different international regions for an airline.



One region makes up about 60% of the airline's flights. Which region is it?

A Asia

B Europe

C New Zealand

D North America

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SECTION B (50 MARKS)
ATTEMPT ALL QUESTIONS

Question 2 **[3]**

a. The table below shows the radius of the Earth and Mars.

Planets	Radius (m)
Earth	6.371×10^6
Mars	3.3895×10^6

i. Which planet has a greater radius? How do you know?

ii. Write the radius of Mars in standard form.

b. If 4% of a mass of a small mineral water bottle is 20 gram. Calculate 12% of the same mass. **[2]**

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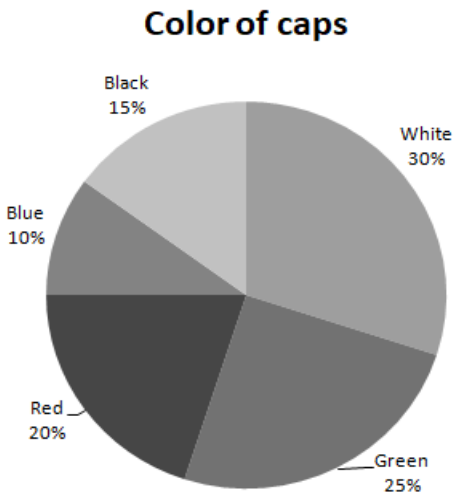
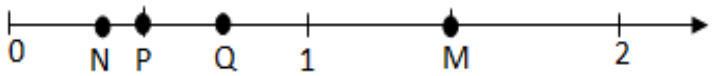
Question 3

a. The circle graph shows the percentage of caps for sale at a sporting goods store. **[2]**



If there are 200 caps, what is the total number of caps that are white and green?

b. The letters **(M, N, P and Q)** represent **fractions** on the number line below. Use this number line to answer questions **i** to **iii.** **[3]**



Each of the equation below is either True or False. Write True or False against each of them.

Equation	True/False
i. P + N = M	
ii. P x Q = N	
iii. M ÷ Q > M	

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Question 4

a. An electronic repairing service provider has a basic charge of Nu 200 and an additional charge of Nu 50 per hour. **[3]**

i. Write an algebraic expression to model the above given situation.

ii. How much will the service provider charge for 3 hours?

b. The table below shows the shadow lengths of four bushes of different heights at 10 a.m. **[2]**

Bush Height (cm)	**Shadow length (cm)**
20	16
40	32
60	48
80	64

What is the shadow length of a bush that has a height of 50 centimetres at the same time?

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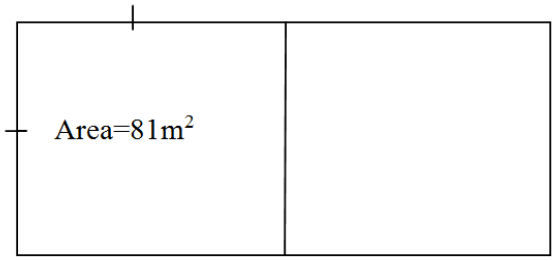
Question 5

a. The area of one side of a volleyball court is $81m^2$ as shown below. What is the perimeter of the full court? **[2]**



b. Durga wants to make a ramp to replace a set of steps that are 2 metres high as shown below. The ratio of the horizontal length of the ramp to its height is 10**:**1. **[3]**

Find the diagonal length of the ramp to the nearest whole number.

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Question 6

a. What happens to the volume of a rectangular prism when you double each dimension? By how many times does the volume change. Show your work. **[3]**

b. Bebek wants to construct a wooden bath tub that can hold 2,000,000 ml of water. **[2]**

Help him to sketch the tub by showing one possible set of dimensions in metre.

Question 7

a. "Microscopes have lenses that can be used to see invisible objects with our naked eyes". **[2]**

State the transformation that has been described in the above statement.

How do you now?

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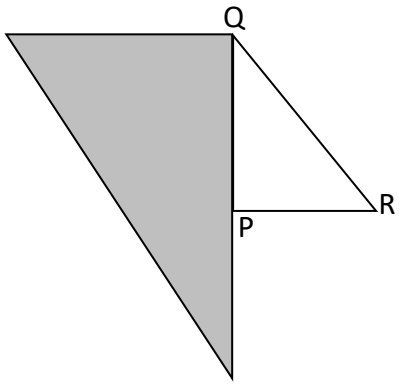
b. Rinzin concludes that he has transformed triangle **PQR** to shaded triangle below by reflecting it along line **PQ** followed by 90° **CCW** rotation around turn centre **Q**. Do you agree with him? Justify with correct explanation. **[3]**



Question 8

a. Create any structure on the isometric dot paper with **10** cubes. **[2]**

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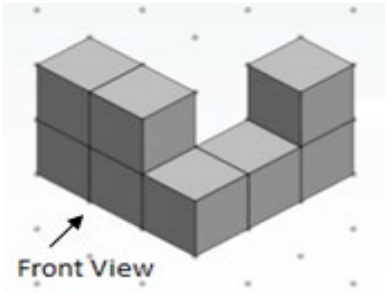
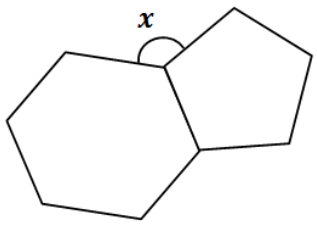
b. Kuenga builds a structure using cubes. The front view is shown below. **[3]**



Draw the right, left and top face views of this structure.

Question 9

a. The diagram below shows two regular polygons attached together. **[2]**



Find the value of angle x .

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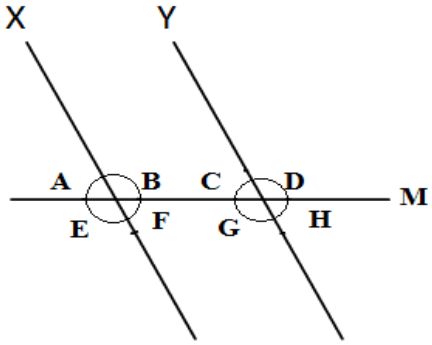
b. Line **X** and **Y** are parallel lines cut by a transversal line **M** as shown below. **[3]**



Find an angle from the above diagram that fits each description given below:

i. An angle that is an alternate to angle **C**.

ii. An angle that is an interior to angle **B**.

iii. An angle that is corresponding to angle **E**.

Question 10

a. A Class VIII Mathematics teacher wants to find out his students attitude towards learning mathematics in his class. Describe how he would use a random sampling method to select 7 students to be interviewed. **[2]**

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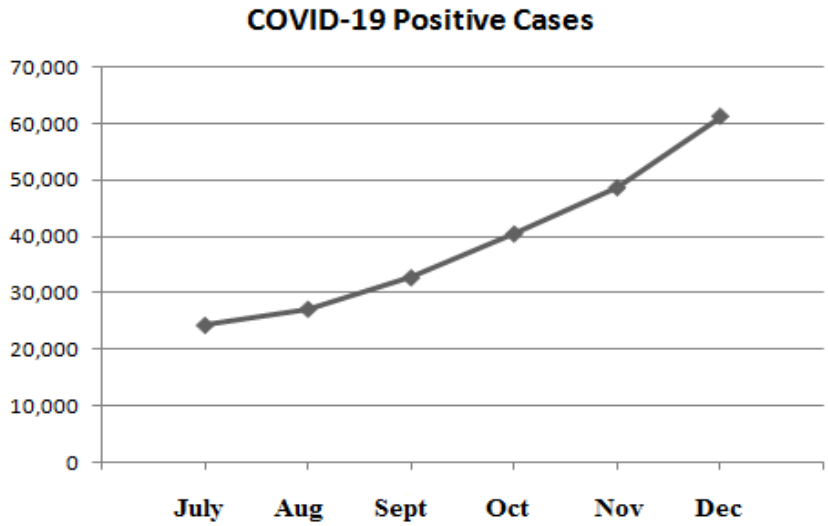
b. The graph below shows the number of COVID-19 positive cases in India for 6 months in 2021. **[3]**



i. Describe the trend shown by the graph.

ii. About how many more cases were reported in December than in September.

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Question 11

a. i. As per U.S. airline reports in 2020, 85% of its flights arrived on time. What is the probability that a flight will be late? **[3]**

ii. Tshering visits one of the Lhakhangs in Haa before his midterm examination. He believes to score good marks, if he gets a sum of 7 on rolling a dice. What will be the probability of getting a sum of 7 when he rolls a die **two times**?

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b. The table below shows Mathematics mean score of 16 countries in PISA, 2018. **[2]**

591	464	453	418	353	402	436	379
400	440	384	414	535	379	400	556

Create a **histogram** to represent the above data on the grid given below.

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The measurement formulas and relationships

Perimeters and circumference

- ✓ Rectangle: 2(Length + width)
- ✓ Square: 4 × side length
- ✓ Circle : $2\pi r$

Area

- ✓ Triangle : $\frac{1}{2} \times base \times height$
- ✓ Rectangle: Length × width
- ✓ Square: side × side
- ✓ Parallelogram: base × height
- ✓ Trapezoid: $\frac{1}{2} \times height \times sum\ of\ length\ of\ two\ parallel\ sides$
- ✓ Circle : πr^2
- ✓ Rectangular Prism: 2 (length×height + height ×width + length ×width)

Volume

- ✓ Rectangle Prism **:** area of base×height

Pythagorean theorem

- ✓ $c^2 = a^2 + b^{2;}$ where 'c' is the hypotenuse and 'a' and 'b' are sides of right angled triangle

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ROUGH WORK

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