BLE Maths ~2081

Bharatpur Metropolitan City

Answer Sheet

Q.N. 1 Ans

Sol^{n}.

(a) Here,
$U = \{a, e, i, o, u\}$
$A = \{e, o, u\}$
$B = \{a, e, i\}$
Then,
Set A and B are overlapping set.

(b) Here,
$A = \{e, o, u\}$
Now,
A proper subset of set A is $\{e\}$ and an improper subset of set A is $\{e, o, u\}$.

(c) If e is eliminated from set A and B then, the sets A and B will be disjoint set.

Q.N. 2 Ans

Sol^{n}.

(a) Binary number system's digits are used while opening and closing the switch of an electric circuit.

(b) Here,

$(35)_{10}$

2	35	1
2	17	1
2	8	0
2	4	0
2	2	0
2	1	1
	0	

$\therefore (35)_{10} = (100011)_2$

(c) Here,

$1010_2 = 1\times2^3+0\times2^2+1\times2^1+0\times2^0$

$= 1\times8+0\times4+1\times2+0\times1$

$= 8+0+2+0$

$= 10_{10}$

Also,

$20_5 = 2\times5^1+0\times5^0$

$= 2\times5+0\times1$

$= 10+0$

$= 10_{10}$

Thus,

$1010_2 = 20_5$

(d) Here,
$0.\overline{24}$
Let,
$x = 0.\overline{24}$
or, $x = 0.2424\ldots$
Multiplying on both sides by 100,
$100x = 24.24\ldots$
or, $100x = 24 + 0.24\ldots$
or, $100x = 24 + x$
or, $100x - x = 24$
or, $99x = 24$
$\therefore x = \frac{24}{99} = \frac{8}{33}$
Thus,
$0.\overline{24} = \frac{8}{33}$ Ans

Q.N.3 Ans

Sol^{n}.
(a) Here,
Marked price of ball A (MP_A) = RS.3750
Marked price of ball B (MP_B) = RS.2500
Then,
$MP_A : MP_B = 3750 : 2500$
$= \frac{3750}{2500}$
$= \frac{3}{2}$
$= 3:2$

(b) Here,
Marked price of ball B (MP) = Rs. 2500
Discount % = 5 %
Now,
Ashok should to pay for ball is

$$= Rs.2500 - 5\% \text{ of } Rs.2500$$

$$= Rs.2500 - \frac{5}{100} \times Rs.2500$$

$$= Rs.2500 - Rs.125$$

$$= Rs.2375$$

(c) Here,
Selling price (SP) = Rs. 2375
profit % = 10 %
Cost price (CP) = ?
Now,

$$CP = \frac{100 \times SP}{100 + P\%}$$

$$= \frac{100 \times 2375}{100 + 10}$$

$$= \frac{237500}{110}$$

$$= Rs.2159.09$$

Thus, the cost price of ball B is Rs. 2159.09.

Q.N.4 Ans

Sol^{n}.

(a) Here,
Principal (P) = Rs. 5000
Time (T) = 3 years
Rate of interest (R) = 10% p.a.
Simple interest (I) = ?
We know that,

$$I = \frac{PTR}{100}$$

$$= \frac{5000 \times 3 \times 10}{100}$$

$$= Rs.1500$$

Thus,
Sarifa gets Rs. 1500 interest after 3 years.

(b) Here,
principal (P) = Rs. 5000
Time (T) = ?
Rate of interest (R) = 10%.
Simple interest (I) = Rs. 5000
We know that,

$$T = \frac{I \times 100}{PR}$$

$$= \frac{5000 \times 100}{5000 \times 10}$$

$$= 10 \text{ years}$$

Thus,
Sarifa wait for 10 years to get double of the invested sum.

(c) Here,
$P = RS.12000$
$T = 3 years$
$R = 10\ \%\ p.a$
$I = ?$
We know that,
$$I = \frac{PTR}{100}$$
$$= \frac{12000 \times 3 \times 10}{100}$$
$$= RS.3600$$
Thus,
RS.3600 interest will be made at the same time and same rate of interest.

Q.N. 5 Ans

Sol^{n}.
(a) Here,
The formula to find the area of the kite is
$$A = \frac{1}{2} d_1 \times d_2$$

(b) Here,
$d_1 = AC = 6m$
$d_2 = BD = 5m$
Now,
The area of the kite shaped land is

$A_1 = \frac{1}{2} d_1 \times d_2$

$= \frac{1}{2} \times 6m \times 5m$

$= \frac{30m^2}{2}$

$= 15m^2$

(c) Here,
Radius of well (r) = 50cm = 0.50m
Now,
The area of the well (A_2) = πr^2

$= \frac{22}{7} \times 0.50 \times 0.50$

$= \frac{5.5}{7}$

$= 0.786 m^2$

Also,
The circumference of the well (C)

$= 2\pi r$

$= 2 \times \frac{22}{7} \times 0.50$

$= \frac{22}{7}$

$= 3.14m$

(d) Here,
Area of the kite shaped land (A_1)
$= 15m^2$
Area of the circular well (A_2)
$= 0.786m^2$
Now,
The difference between the area of kite shaped land and circular well is
$= 15m^2 - 0.786m^2$
$= 14.214m^2$

Q.N. 6 Ans

Sol^{n}.
(a) Square figure's area is represented by x^2.

(b) Here,
$$\left(\frac{x^3y^2}{x^4y}\right)^2$$

$$= \frac{x^6y^4}{x^8y^2}$$

$$= \frac{y^{4-2}}{x^{8-6}}$$

$$= \frac{y^2}{x^2}$$ Ans

Q.N. 7 Ans

Sol^{n}.

(a) Here,

$x^2 - 16$, $x^2 - 9x + 20$

1st expression $= x^2 - 16$

$= x^2 - 4^2$

$= (x+4)(x-4)$

2nd expression $= x^2 - 9x + 20$

$= x^2 - (4+5)x + 20$

$= x^2 - 4x - 5x + 20$

$= x(x-4) - 5(x-4)$

$= (x-4)(x-5)$

$\therefore$ HCF $= (x-4)$

(b) Here,

$x^2 - 16 = 0$

or, $x^2 = 16$

or, $x = \sqrt{16}$

$\therefore x = \pm 4$

Thus, the values of x are 4 and -4 then, $x^2 - 16$ becomes zero.

Q.N. 8 Ans

Sol^{n}.

(a) $ax+by+c=0$ is a linear equation.

(b) Here,

$$\frac{m^2-n^2}{n^2} \div \frac{m^2+mn}{mn}$$

$$= \frac{m^2-n^2}{n^2} \times \frac{mn}{m^2+mn}$$

$$= \frac{(m+n)(m-n)}{n \times n} \times \frac{m \times n}{m(m+n)}$$

$$= \frac{m-n}{n}$$ Ans

Q.N. 9 Ans

Sol^{n}.

(a) Here,

$y = 55°$

$\angle PQM = \angle QMR$ [$\because$ Alternate angle]

So,

The line segments PQ and MR are parallel to each other.

(b) Here,
$RS \parallel MN$, $\angle SRM = (2x+3)^\circ$, $\angle RMN = 73^\circ$
Then,
$\angle SRM + \angle RMN = 180^\circ$ [$\because$ Co-interior angle]
or, $(2x+3)^\circ + 73^\circ = 180^\circ$
or, $2x + 3^\circ + 73^\circ = 180^\circ$
or, $2x = 180^\circ - 76^\circ$
or, $2x = 104^\circ$
or, $x = \frac{104^\circ}{2}$
$\therefore x = 52^\circ$
Thus,
the value of x is 52°

(c) Here,
Given:- We should draw to different isosceles triangle with different measurement.

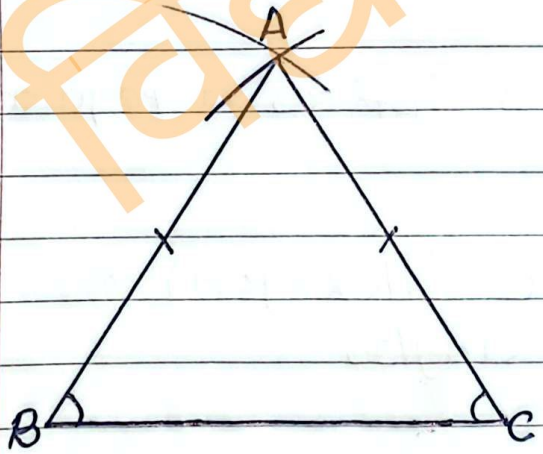


Fig.(a)

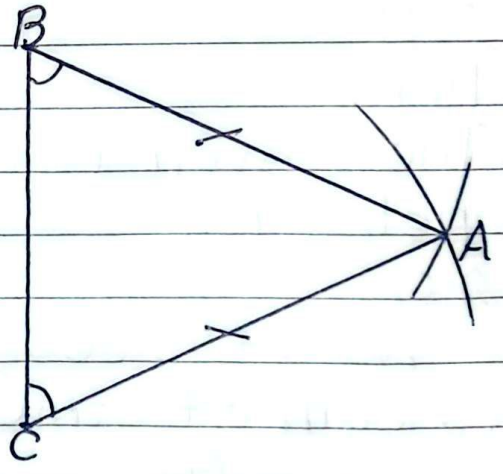


Fig.(b)

To prove:- $\angle ABC = \angle ACB$

Observation

Figure	∠ABC	∠ACB	Result
(a)	57°	57°	∠ABC = ∠ACB = 57°
(b)	65°	65°	∠ABC = ∠ACB = 65°

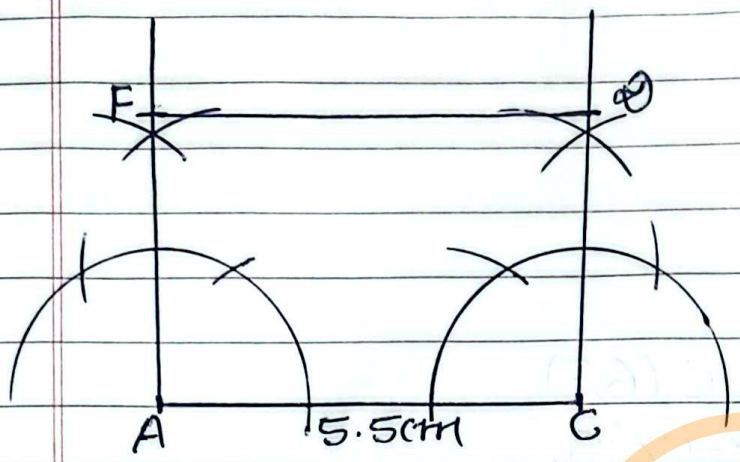
Conclusion:- From the above experiment, we conclude that the base angles of an isosceles triangle are equal.

Q.N. 10 Ans

Sol^{n}.

(a) Here,
The given figure ABCDEF is a regular polygon.
So,
No. of sides, $n = 6$ (Hexagon)
∴ Sum of interior angles
$= (n-2) \times 180^\circ$
$= (6-2) \times 180^\circ$
$= 4 \times 180^\circ$
$= 720^\circ$ Ans

(b) Here,
AC = 5.5cm
AF = 3.6cm



Hence, we construct rectangle ACDF using the given measurement.

Q.N. 11 Ans

Sol[n.

(a) This is regular tessellation.

(b) Here,
p = 3m, b = 4m and h = ?
By using pythagoras theorem,

$$h = \sqrt{p^2 + 6^2}$$

$$= \sqrt{3^2 + 4^2}$$

$$= \sqrt{9 + 16}$$

$= \sqrt{25}$

$= 5$ m

Thus, the required shortest distance is 5m.

(c) Here,
Given vertices,
A(2,2), B(4,6), C(6,3)
Reflect it on x-axis,
$P(x,y) \longrightarrow P'(x,-y)$
Then,
$A(2,2) \longrightarrow A'(2,-2)$
$B(4,6) \longrightarrow B'(4,-6)$
$C(6,3) \longrightarrow C'(6,-3)$

Graph

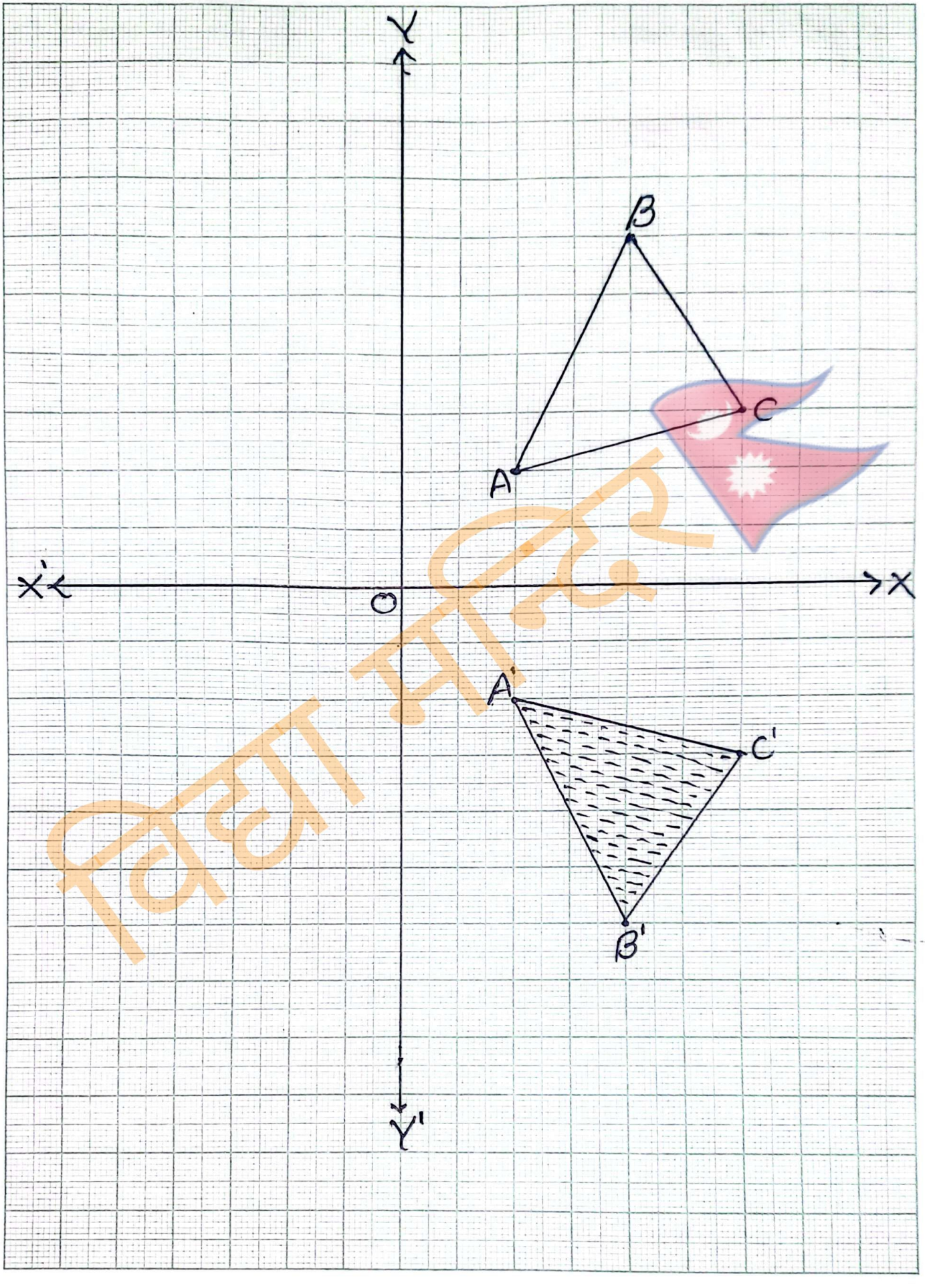
Q.N. 12 Ans

Sol^{n}.
(a) Chicken represents the mode value.

(b) Here,
Total no. of animals, $\Sigma x = 450 + 200 + 200 + 50$
$= 900$

$N = 4$

Q.N. 11(c) AMS



∴ Average no. of animals is

$$\bar{x} = \frac{\Sigma x}{N}$$

$$= \frac{900}{4}$$

$$= 225 \text{ Ans}$$

The End

[Set 4]

भरतपुर महानगरपालिका

आधारभूत शिक्षा उत्तीर्ण परीक्षा-२०८१

अनिवार्य गणित(Compulsory Mathematics)

कक्षा(Class): 8 समय(Time): 2 hours पूर्णाङ्क(Full Marks): 50

सबै प्रश्नहरू अनिवार्य छन् । (Attempt all the question)

1. सर्वव्यापक समूह U = {a, e, i, o, u} का दुईवटा उपसमूह A = {e, o, u} र B = {a, e, i} छन् । (Two subsets of universal set U = {a, e, i, o, u} are A = {e, o, u} and B = {a, e, i}.)
   (a) समूह A र समूह B खप्टिएका वा अलग्गिएका कस्ता समूह हुन् ? लेख्नुहोस् । (What types of set are A and B overlapping or disjoint? Write it.) [1]
   (b) A को एउटा उपयुक्त र एउटा अनुपयुक्त उपसमूह लेख्नुहोस् । (Write one proper and one improper subset of A.) [1]
   (c) समूहहरू A र B बाट e लाई हटाउँदा समूह A र B कुन प्रकारका समूह बन्छन् ? कारणसहित लेख्नुहोस् । (If e is eliminated from sets A and B, then what types of sets are A and B? Write with a reason.) [1]
2. सङ्ख्याङ्कन पद्धतिमा B_{10} = {0, 1, 2, 3, ...8, 9}, B_2 = {0, 1}, B_5 = {0, 1, 2, 3, 4} समूह छन् । (In the numeration system, sets B_{10} = {0, 1, 2, 3, ...8, 9}, B_2 = {0, 1}, B_5 = {0, 1, 2, 3, 4} are given.)
   (a) विद्युत् सर्किटको स्विच खोल्दा र बन्द गर्दा कुन सङ्ख्या पद्धतिका अङ्कहरू प्रयोग हुन्छन् ?(Which number system's digits are used while opening and closing the switch of an electric circuit?) [1]
   (b) 35 लाई द्विआधार सङ्ख्या पद्धतिमा रूपान्तरण गर्नुहोस् । (Convert 35 into the binary number system.) [2]
   (c) 1010_2 र 20_5 बिच के सम्बन्ध रहेको छ? मूल्याङ्कन गर्नुहोस् । (What is the relation between 1010_2 and 20_5 ? Evaluate.) [1]
   (d) सङ्ख्या $0.\overline{24}$ लाई भिन्नमा रूपान्तरण गर्नुहोस् । (Convert the number $0.\overline{24}$ into fraction.) [1]
3. अशोक महतो स्टेसनरीमा एउटा बल किन्न गए । त्यहाँ उनले चित्रमा देखाए जस्तै गरी राखेका बलहरू A र B हेरेछन् । ती दुईओटा बल A र B को अङ्कित मूल्यको अनुपात 3:2, बल A को अङ्कित मूल्य रू.3,750, बल B को अङ्कित मूल्य रू.2,500 र छुट 5% लेखेको पाए ।

छुट (Discount) = 5%

(Ashok Mahato went to a stationary to buy a ball. He saw two balls A and B as shown in the adjoining figure. The ratio of marked prices of ball A and ball B is 3:2, the marked price of ball A is Rs.3,750; the marked price of ball B is Rs.2,500 and 5% discount is written.)

(a) वलहरू A र B को अङ्कित मूल्यलाई समानुपातमा लेख्नुहोस् । (Write the marked prices of balls A and B in the proportion.) [1]

(b) अशोक महतोले बल B किन्ने निधो गरेछन् भने उक्त बललाई उनले कति रकम तिर्नुपर्छ ? पत्ता लगाउनुहोस् । (If Ashok Mahato decided to buy ball B, what amount should he pay for it? Find it.) [1]

(c) छुटपछिको मूल्यमा बल बिक्री गर्दा पसलेले 10% नाफा गर्ने सोच बनाउँदा बल B लाई पसलेले कतिमा किनेको हुनुपर्छ ?(If the shopkeeper thought to get 10% profit by selling the ball after discount, at what price did he buy ball B?) [2]

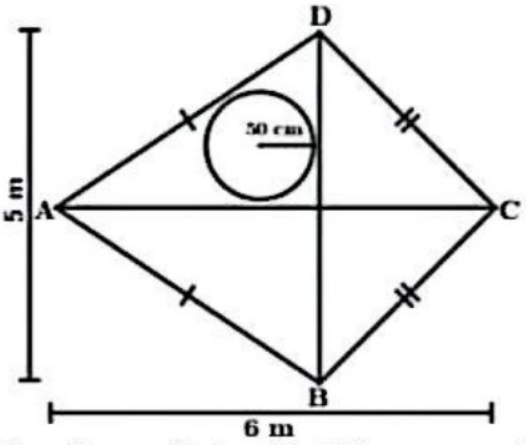
4. सरिफाले आफूसँग भएको रकम रू. 5,000 लाई 3 वर्षका लागि मनसुरलाई ऋणमा लगानी गरिछन् । ऋण लगानी गर्दा वार्षिक 10%साधारण व्याजदर लिने दिने कुरा तय भएछ । (Sarifa invested her money Rs.5,000 as the loan and lent it to Mansur for 3 years. They agreed to give and take 10% simple interest per year.)

(a) सरिफाले व्याज स्वरूप कति रकम पाइन् ?(How much interest is obtained by Sarifa?) [1]

(b) सरिफाले लगानी गरेको रकम दोब्बर हुन कति समय पर्खनुपर्ला ?(How long should Sarita wait to get double of that invested sum?) [2]

(c) रू. 12000 को सोही समयमा र सोही व्याजदरमा प्राप्त हुने व्याज कति होला ?(What will be the interest of Rs.12000 at the same time and at the same rate of interest?) [1]

5. चित्रमा ABCD एउटा चङ्गा आकारको जग्गा हो जहाँ विकर्ण AC = 6 मि. र BD = 5 मि. छ । उक्त चङ्गाकार जग्गाको विचमा 50 से.मि. अर्धव्यास भएको वृत्तकार इनार रहेको छ । (In the figure, ABCD is a kite-shaped plot where diagonals AC = 6 m and BD = 5 m. In that kite-shaped plot, there is a circular well having the radius of 50 cm.)



(a) चङ्गाको क्षेत्रफल निकाल्ने सूत्र लेख्नुहोस् । (Write the formula to find the area of the kite.) [1]

(b) चङ्गा आकारको जग्गाको क्षेत्रफल निकाल्नुहोस् । (Calculate the area of the kite-shaped land.) [1]

(c) वृत्ताकार इनारको क्षेत्रफल र परिधि पत्ता लगाउनुहोस् । (Find the area and circumference of the circular well.) [2]

(d) वृत्ताकार इनारको क्षेत्रफल र चङ्गाकार जग्गाको क्षेत्रफलबिचको फरक गणना गरी पत्ता लगाउनुहोस् । (What is the difference in area of circular well and kite-shaped plot? Find it by calculation.) [1]

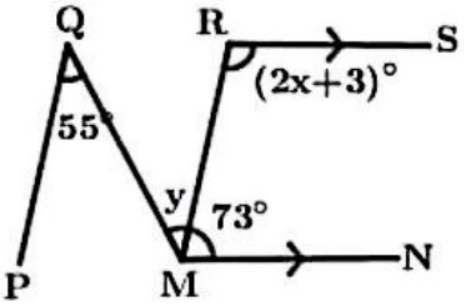
6. (a) x^2 ले कुन ज्यामितीय आकृतिको क्षेत्रफललाई प्रतिनिधित्व गर्छ ?(Which geometrical figure's area is represented by x^2?) [1]

(b) सरल गर्नुहोस् । (Simplify) : $\left(\frac{x^3y^2}{x^4y}\right)^2$ [2]

7. दुईओटा बीजीय $x^2 - 16$ र $x^2 - 9x + 20$ छन् । (Two algebraic expressions are $x^2 - 16$ and $x^2 - 9x + 20$.)
   (a) दिइएका अभिव्यञ्जकहरूको महत्तम समापवर्तक (म.स.) पत्ता लगाउनुहोस् । (Find the highest common factor (H.C.F.) of the given algebraic expressions.) [2]
   (b) x को मान कति भएमा अभिव्यञ्जक $x^2 - 16$ को मान शून्य हुन्छ ? (What is the value of x when the value of the expression $x^2 - 16$ is zero?) [2]

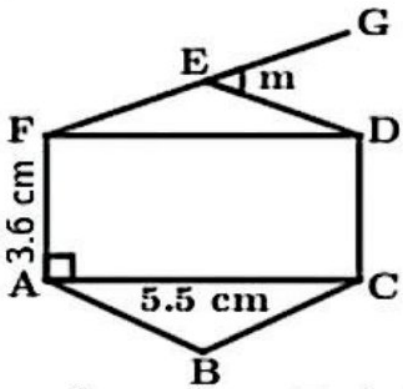
8. (a) $ax + by + c = 0$ कस्तो प्रकारको समीकरण हो ? (What type of equation is $ax + by + c = 0$?) [1]
   (b) $\frac{m^2-n^2}{n^2}$ लाई $\frac{m^2+mn}{mn}$ ले भाग गर्दा आउने भागफल निकाल्नुहोस् । (Find the quotient while dividing $\frac{m^2-n^2}{n^2}$ by $\frac{m^2+mn}{mn}$.) [2]

9. प्रस्तुत चित्रमा RS//MN, ∠PQM =55°, ∠QMR = y, ∠MRS = (2x + 3)° र ∠RMN = 73° छ । (In the given figure, RS//MN, ∠PQM =55°, ∠QMR = y, ∠MRS = (2x + 3)° and ∠RMN = 73°.)



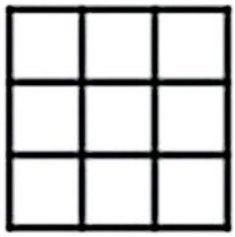
   (a) यदि y = 55° छ भने रेखा खण्डहरू PQ र MR को सम्बन्ध लेख्नुहोस् । (If y = 55°, write the relation between the line segments PQ and MR.) [1]
   (b) x को मान पत्ता लगाउनुहोस् । (Find the value of x.) [1]
   (c) समद्विबाहु त्रिभुजका आधारका कोणहरू बराबर हुन्छन् भनी प्रयोगात्मक रूपमा परीक्षण गर्नुहोस् । (फरक फरक नापका दुईओटा चित्र आवश्यक छ ।) (Verify experimentally that the base angles of an isosceles triangle are equal. (Two figures of different size are necessary.)) [3]

10. दिइएको चित्र ABCDEF नियमित बहुभुज हो । ACDF एउटा आयत हो, जहाँ AC = 5.5 से.मि. र AF = 3.6 से.मि. छ । बहुभुजको भुजा FE लाई बिन्दु G सम्म बढाउँदा ∠GED = m छ । (The given figure ABCDEF is a regular polygon. ACDF is a rectangle where AC = 5.5 cm and AF = 3.6 cm. Side FE is produced to a point G where ∠GED = m.)



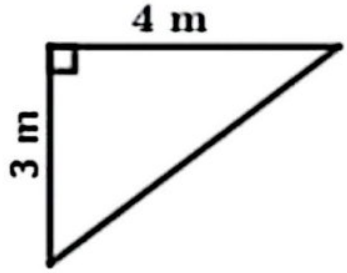
   (a) दिइएको नियमित बहुभुजको भित्री कोणहरूको योगफल पत्ता निकाल्नुहोस् । (Find the sum of interior angles of the given regular polygon.) [2]

(b) दिइएको आयत ACDF को नापसँग बराबर हुने गरी अर्को एउटा आयतको रचना गर्नुहोस् । (Construct another rectangle having the same dimension as given rectangle ACDF.) [3]



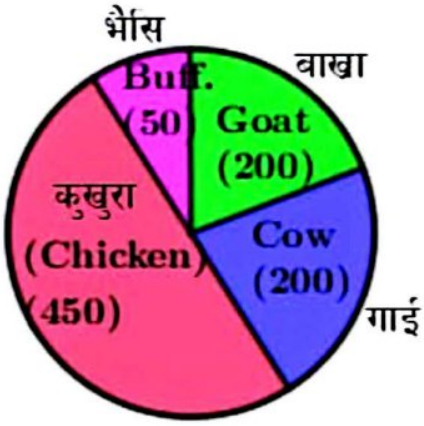
11. (a) चित्रमा दिइएको टेसेलेसन कस्तो प्रकारको टेसेलेसन हो ?(What type of tessellation is in the given figure?) [1]

(b) एउटा मानिस उत्तरतिर 3 मिटर हिँड्यो र पूर्वतर्फ 4 मिटर अगाडि बढ्यो । अब सुरुको स्थान र अन्तिम स्थानबिचको सबैभन्दा छोटो दुरी कति होला ? गणना गर्नुहोस् । (A man walks towards north 3 meters and took a turn to the east and walked 4 meters more. What will be the shortest distance between the initial place and the final place? Calculate it.) [1]



(c) A (2, 2), B (4, 6) र C(6, 3) एउटा त्रिभुज ABC का शीर्षबिन्दुहरू हुन् । उक्त त्रिभुजलाई लेखाचित्रमा अङ्कन गरी X-अक्षमा परावर्तन गर्दा प्राप्त हुने प्रतिबिम्बलाई पनि लेखाचित्रमा अङ्कन गर्नुहोस् । (A (2, 2), B (4, 6) and C(6, 3) are the vertices of triangle ABC. Draw the triangle on the graph and also plot the image so obtained by reflecting on the X-axis in the graph. [3]

12. दायाँको वृत्तचित्रमा देवचुली पशुपालन फार्ममा भएका पशुहरूको सङ्ख्यात्मक विवरण देखाइको छ । उक्त फार्ममा जम्मा चार प्रकारमा पशुहरू राखिएको देखिन्छ । उक्त वृत्तचित्रको आधारमा दिइएका समस्याहरूको समाधान गर्नुहोस् । (The adjoining pie-chart presents the numerical details of the animals found in Devchuli animal husbandry. Four types of animals are shown in that animal husbandry. Solve the problems on the basis of the given pie-chart.)



पशुपालन सम्बन्धी वृत्तचित्र
(Pie-Chat Related Animal Husbandry)

(a) रीत मान जनाउने जनावरहरूको नाम लेख्नुहोस् । (Write the names of animals that represent the mode value.) [1]

(b) जनावरहरुको औसत सङ्ख्या पत्ता लगाउनुहोस् । (Find the average number of animals.) [2]

-The End-