BLE ~ 2081 (2025)

Biratnagar Metropolitan City

Answer Sheet

Q.N. 1 Ans

Sol^{n}.

(a) Two sets are called disjoint sets if they have no common elements.
For eg:- $A = \{a, b, c\}$
$B = \{1, 2, 3\}$

(b) Here,
$P = \{1, 2, 3, 4, 5\}$
One proper subset of P is
$\{1, 2\}$.

(c) If the common elements 5 is removed from the Venn diagram then the setp and Q will be disjoint.

Q.N. 2 Ans

Sol^{n}.

(a) If the marked price and discount are denoted by MP and D respectively then, the formula to find the selling

price is

$SP = MP - D$

(b) Here,
Marked price (MP) = Rs. 24000
Discount % (D%) = 15%
Now,
Discount amount (D) = D% of MP

= 15% of 24000

$= \frac{15}{100} \times 24000$

= Rs. 3600

(c) Here,
Selling price (SP) = MP - D
= Rs. (24000 - 3600)
= Rs. 20,400
profit = Rs. 2400
Cost price (CP) = ?
Now,
CP = SP - profit

= Rs. 20400 - Rs. 2400

= Rs. 18000

Q.N.3 Ans

Sol^n.

(a) At 12% per annum had Sunil deposited the amount.

(b) Here,
principal (P) = Rs. 3,00,000
Time (T) = 3 years
Rate of interest (R) = 12%
Total amount (A) = ?
We have,
Simple interest (I) $= \frac{PTR}{100}$

$= \frac{300000 \times 3 \times 12}{100}$

= Rs. 1,08,000

Also,
Total amount (A) = P + I

= Rs. (3,00,000 + 1,08,000)

= Rs. 4,08,000

Thus,
Sunil gets Rs. 4,08,000 with principal and interest.

(c) Here,
Divides Rs. 3,00,000 to Chandan and Ram in the ratio of 2:3,

Chandan gets = Rs. $2x$
Ram gets = Rs. $3x$
Now,
$2x + 3x$ = Rs. 300000

or, $5x = 300000$

or, $x = \frac{300000}{5}$

$\therefore x = 60,000$ Rs.
Also,
$2x = 2 \times$ Rs. 60000 = Rs. 1,20,000
$3x = 3 \times$ Rs. 6000 = Rs. 1,80,000
Thus, Chandan and Ram gets Rs. 1,20,000 and 1,80,000.

Q.N. 4 Ans

Sol:

(a) Here,
$35750 = 3.575 \times 10^4$ Ans

(b) Here,
A wheel rotates in 60 minutes
$= 35750$ times

$\therefore$ A wheel rotates in 90 minutes

$$= \frac{35750}{60} \times 90$$

$$= \frac{321750}{6}$$

$$= 53,625 \text{ times}$$

(c) Here,
$\sqrt{48} + \sqrt{75} - \sqrt{3}$

$= \sqrt{(2\times2)\times(2\times2)\times3} + \sqrt{(5\times5)\times3} - \sqrt{3}$

$= 2\times2\sqrt{3} + 5\sqrt{3} - \sqrt{3}$

$= 4\sqrt{3} + 5\sqrt{3} - 1\sqrt{3}$

$= (4+5-1)\sqrt{3}$

$= 8\sqrt{3}$ Ans

(d) Here,
$0.\overline{24}$
Let, $x = 0.\overline{24}$

or, $x = 0.2424\ldots$
Multiplying both sides by 100,

$100x = 24.24\ldots$

or, $100x = 24 + 0.24\ldots$

or, $100x = 24 + x$

or, $100x - x = 24$

or, $99x = 24$

or, $x = \frac{24^{8}}{\cancel{99}_{33}}$

$\therefore x = \frac{8}{33}$

Thus,
$0.\overline{24} = \frac{8}{33}$

Q.N. 5 Ans

Sol^{n}.

(a) The formula to find the area of circle is

$$A = \pi r^2$$

(b) Here,
Diameter of circle (d) = 28cm
Now,
Radius of circle (r) $= \frac{d}{2}$

$$= \frac{28}{2}$$

$$= 14\text{cm}$$

(c) Here, length of square (l) = 28cm
Area of square (A_1) $= l^2$

$$= (28\text{cm})^2$$

$$= 784\text{cm}^2$$

Also,
Area of circle (A_2) $= \pi r^2$

$$= \frac{22}{7} \times 14 \times 14$$

$$= 616\text{cm}^2$$

Now,
The area of shaded region (A)

$= A_1 - A_2$

$= 784 cm^2 - 616 cm^2$

$= 168 cm^2$

(d) Here,
perimeter of square (P) $= 4l$
$= 4 \times 28 cm$
$= 112 cm$

Also,
Circumference of circle (C) $= 2\pi r$

$= 2 \times \frac{22}{7} \times 14 cm$

$= 88 cm$

Thus,
The perimeter of square is greater than the circumference of circle by
$= 112 cm - 88 cm$
$= 36 cm$

Q.N. 6 Ans

Sol^n.

(a) Here,

$$x^m \times x^{-n}$$

$$= x^{m-n} \quad \text{Ans}$$

(b) Here,

$$\frac{a}{(a-b)^2} - \frac{b}{(a-b)^2}$$

$$= \frac{a-b}{(a-b)^2}$$

$$= \frac{(a-b)}{(a-b)(a-b)}$$

$$= \frac{1}{(a-b)}$$

Q.N. 7 Ans

Sol^n.

(a) Simultaneous equations are two or more equations that are solved together to find the values of the same variables.

Eg:- $x+y=7$

$x-y=2$

(b) Here,
Given eqⁿ.
$x+y=6 \longrightarrow (1)$
$x-y=2 \longrightarrow (2)$
From eqⁿ. (1),
$x+y=6$
$\therefore y=6-x$

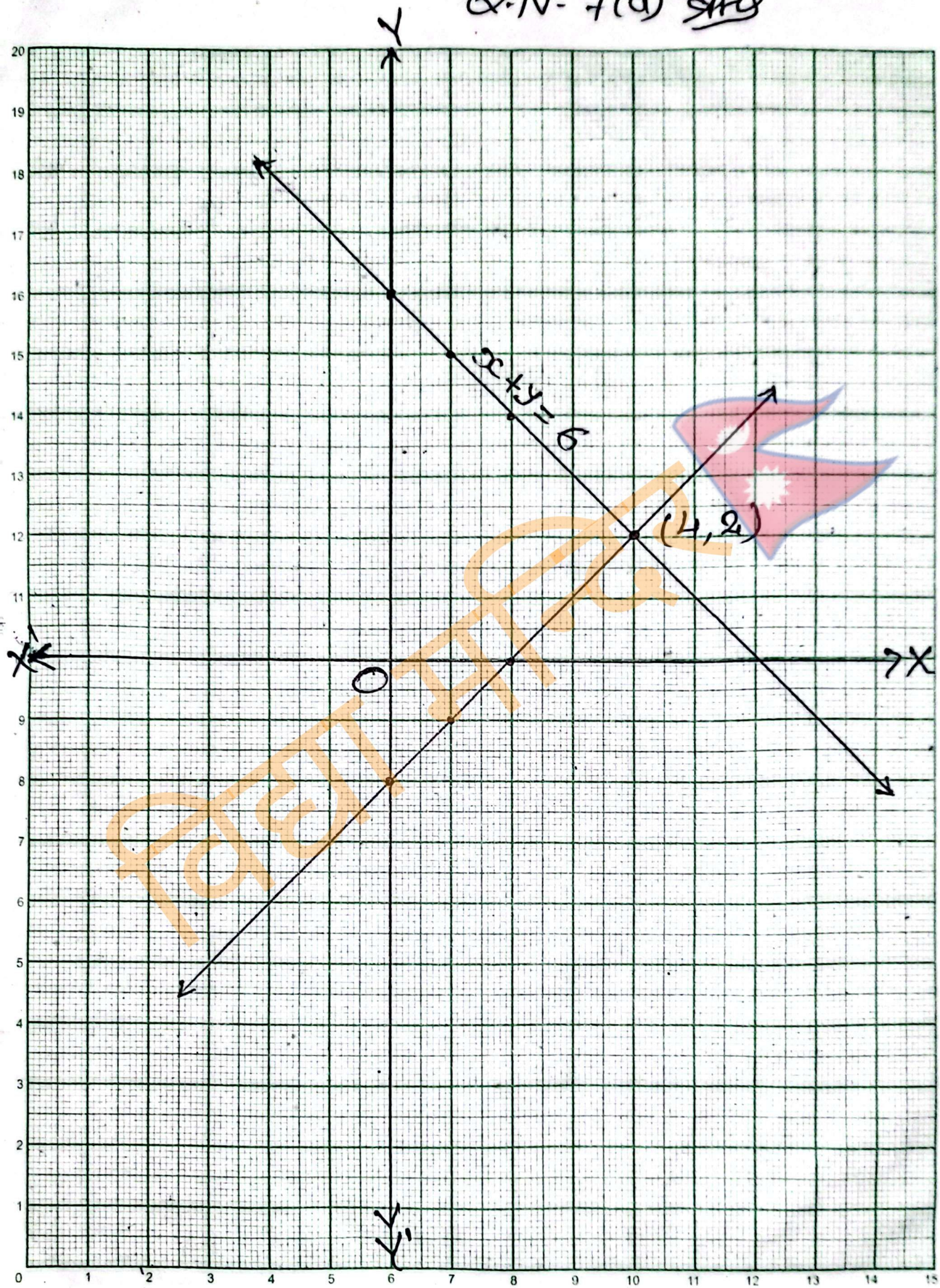
x	0	1	2
y	6	5	4

From eqⁿ. (2),
$x-y=2$
$\therefore y=x-2$

x	0	1	2
y	-2	-1	0

From graph,
$(x, y) = (4, 2)$ ans

Q.N-7(a) Ans



Q.N.8 Ans

Sol^{n}.

(a) Here,
$x^2-7x+12$, $3x^2-27$

1st expression $= x^2-7x+12$
$= x^2-(4+3)x+12$
$= x^2-4x-3x+12$
$= x(x-4)-3(x-4)$
$= (x-4)(x-3)$

2nd expression $= 3x^2-27$
$= 3(x^2-9)$
$= 3(x^2-3^2)$
$= 3(x+3)(x-3)$

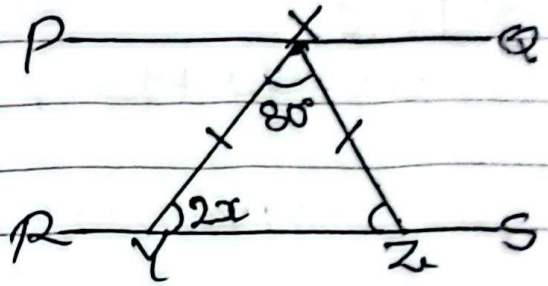
$\therefore$ LCM $= 3(x-3)(x+3)(x-4)$

(b) Here,
$x=2$ and $x=3$
Then,
$x-2=0$ and $x-3=0$
Now,
$(x-2)(x-3)=0$
or, $x\times(x-3)-2(x-3)=0$
or, $x^2-3x-2x+6=0$
or, $x^2-5x+6=0$
This is required quadratic equation.

Q.N. 9 AHS

Sol^{n}

(a) Here,
In ΔXYZ,
$XY = XZ$
Then,
$\angle XYZ = \angle XZY$
Thus,
$\angle XYZ$ and $\angle XZY$ are equal to each other.



(b) Here,
In ΔXYZ
$\angle XYZ = \angle XZY = 2x$
$\angle YXZ = 80^\circ$
Now,
$\angle XYZ + \angle XZY + \angle YXZ = 180^\circ$

or, $2x + 2x + 80^\circ = 180^\circ$

or, $4x = 180^\circ - 80^\circ$

or, $4x = 100^\circ$

or, $x = \frac{100^\circ}{4}$

$\therefore x = 25^\circ$

Thus, the value of x is 25°.

(c) Here,

$\angle PXY = \angle XYZ$ [$\because$ Alternate angle]

$= 2x$

$= 2 \times 25^\circ$

$= 50^\circ$

If $\angle PXY = 50^\circ$ then, the line segments PQ and RS will be parallel.

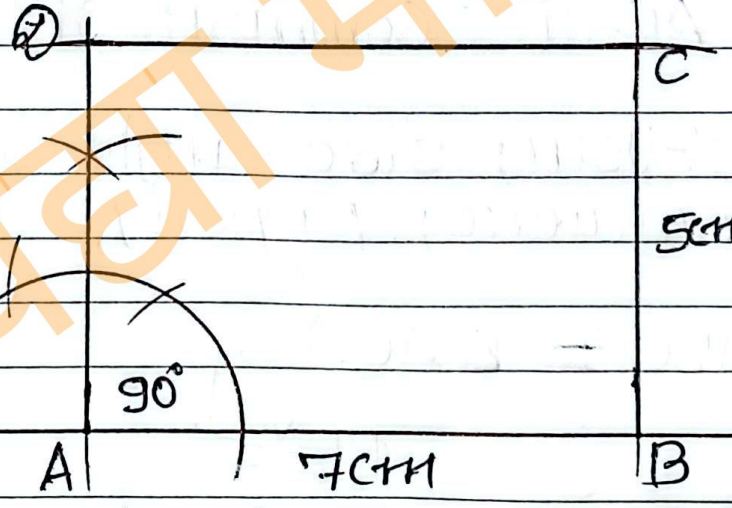
Q.N. 10 Ans →

Sol[n].

(a) Here,

AB = 7cm

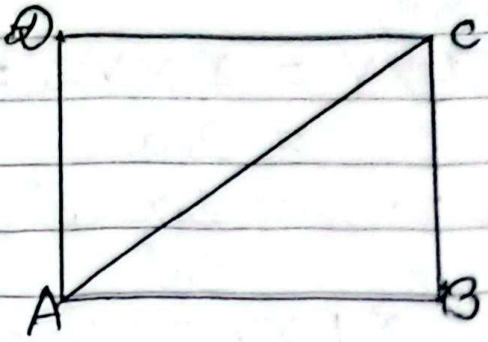
BC = 5cm



We construct □ABCQ of the given measurement.

(b) Here,

Given:- In a rectangle ABCD, AC is a diagonal.



To prove:-

$\Delta ABC \cong \Delta ACD$

Proof:

1. $AD = BC$ & $AB = CD$ [∵ opposite sides of rectangle]

2. $\angle ABC = \angle ADC$ [∵ All angles of rectangle are 90°]

3. $AC = AC$ [∵ Common side]

Conclusion:- Using side-angle-side (SAS) congruency property,

$\Delta ABC \cong \Delta ACD$

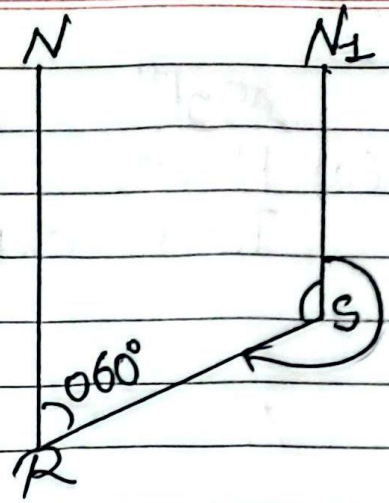
proved

Q.N. 11 Ans

Sol[n]

(a) A regular tessellation is a pattern made by repeating only one type of regular polygon in such a way that there is no gaps or overlaps.

(b) Here,
The bearing of S from the place R is 060°.



$\angle NRS + \angle N_1SR = 180°$

or, $060° + \angle N_1SR = 180°$

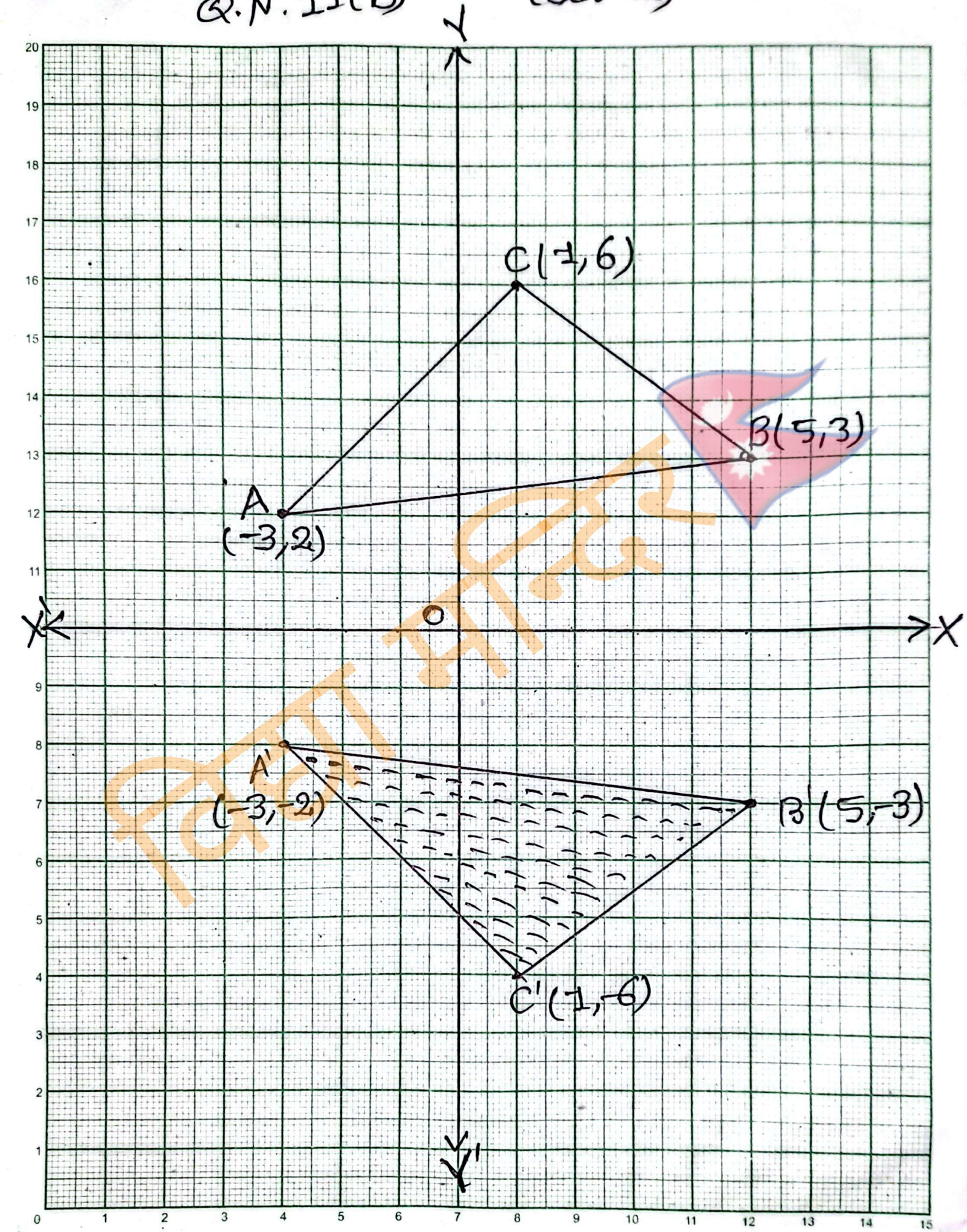
or, $\angle N_1SR = 180° - 060°$

$\therefore \angle N_1SR = 120°$

Now,
The bearing of R from the point S
$= 360° - 120°$
$= 240°$

(c) Here,
Given vertices,
$M(2,1), N(4,3), O(-1,2)$
Reflection on x-axis
$P(x,y) \longrightarrow P'(x,-y)$
Then,
$M(2,1) \longrightarrow M'(2,-1)$
$N(4,3) \longrightarrow N'(4,-3)$
$O(-1,2) \longrightarrow O'(-1,-2)$

Q.N. 11(b) (Set-2)



Q.N. 12 Ans

Sol^{n}.

(a) Here,
Total expenditure, Σx = RS.(4000 + 2500 + 2000 + 1700 + 1800)
= RS. 12000

$N = 5$
Average expenditure ($\bar{X}$) = ?
Now,

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

$$= \frac{12000}{5}$$

= RS. 2400

Thus, the monthly average expenditure is RS. 2400.

(b) Here,
Total expenditure = RS. 12000
Let,
RS. 12000 = 360°

$$RS.\ 1 = \left(\frac{360}{12000}\right)^{\circ}$$

Now,
Expenditure on Ashoj in degree

$$= \frac{360}{12000} \times 4000$$

$$= 120^{\circ}$$

Expenditure on Kartik in degree

$$= \frac{360}{12000} \times 2500$$

$$= 75^\circ$$

Expenditure on Mangsir in degree

$$= \frac{360}{12000} \times 2000$$

$$= 60^\circ$$

Expenditure on Poush in degree

$$= \frac{360}{12000} \times 1700$$

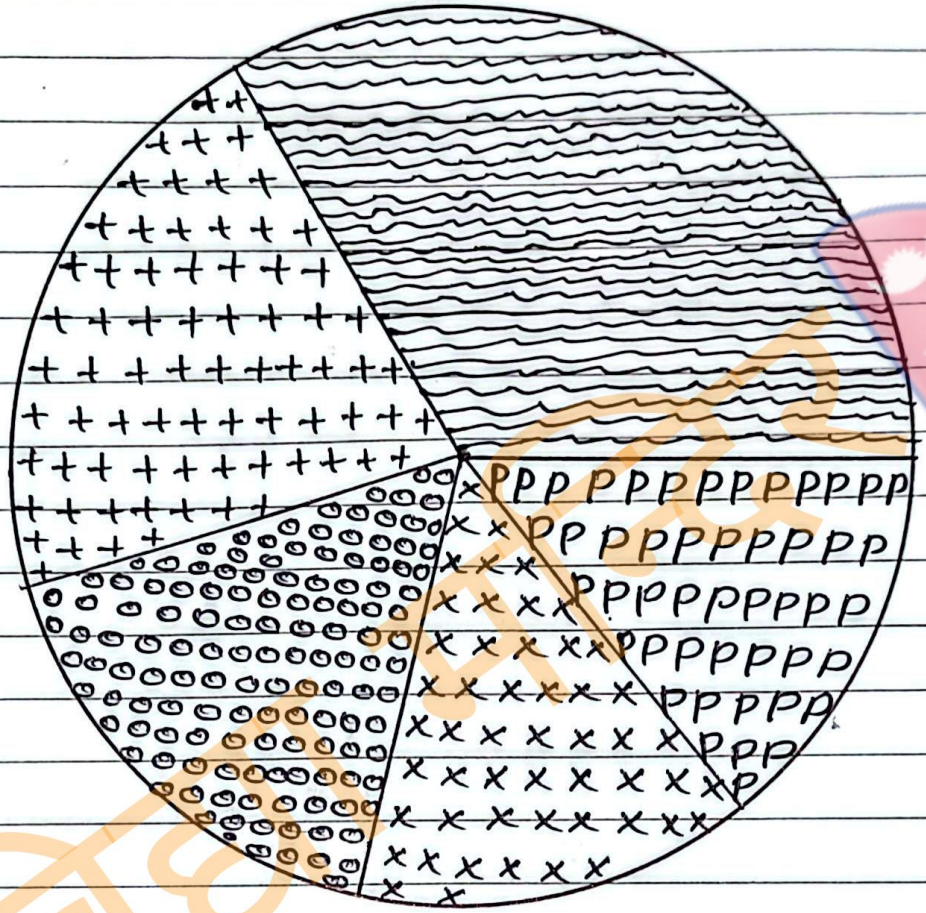
$$= 51^\circ$$

Expenditure on Magh in degree

$$= \frac{360}{12000} \times 1800$$

$$= 54^\circ$$

Showing it in a pie chart,



Ashoj	
Kartik	
Mangsir	
poush	
Magh	

The End

[Set 3]

Biratnagar Metropolitan City

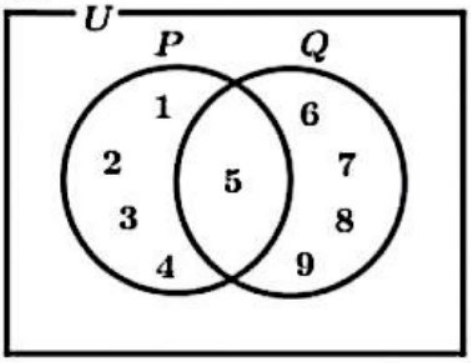
BASIC LEVEL EXAMINATION - 2081

Class: 8 | Full Marks: 50

Sub: Compulsory Mathematics | Time: 2 hr.

सबै प्रश्नहरू अनिवार्य छन् । (All questions are compulsory.)

1. दिइएको भेनचित्रको अध्ययन गरी सोधिएका प्रश्नहरूको उत्तर दिनुहोस् । (Study the given Venn-diagram and answer the following questions.)



   (a) अलग्गिएका समूहलाई परिभाषित गर्नुहोस् । (Define disjoint sets.) [1]

   (b) समूह P को कुनै एउटा उपयुक्त उपसमूह लेख्नुहोस् । (Write any one proper subset of P.) [1]

   (c) दुवैको साझा सदस्य 5 लाई भेनचित्रबाट झिकियो भने समूह P र Q बिच कस्तो सम्बन्ध बन्छ ? लेख्नुहोस् । (If the common element 5 is removed from the Venn-diagram then what will be the relation between the set P and set Q? Write.) [1]

2. एउटा टेलिभिजनको अङ्कित मूल्य रू. 24,000 छ । यदि 15% छुट दिएर बेच्दा पसलेलाई रू. 2,400 नाफा भयो भने, (The marked price of a television is Rs.24,000. If the shopkeeper got Rs.2,400 profit after selling it with 15% discount, then,)

   (a) अङ्कित मूल्य र छुट रकमलाई क्रमशः MP र D ले जनाउने हो भने छुटपाछिको विक्रय मूल्य पत्ता लगाउने सूत्र लेख्नुहोस् । (If marked price and discount amount are represented by MP and D respectively then write the formula to find the selling price after discount.) [1]

   (b) पसलेले उक्त टेलिभिजन बेच्न कति रकम छुट दिएका रहेछन् ? पत्ता लगाउनुहोस् । (How much discount had been given by shopkeeper to sell the television? Find it.) [2]

   (c) उक्त टेलिभिजनको क्रय मूल्य पत्ता लगाउनुहोस् । (Find the cost price of the television.) [2]

3. सुनिलले एक वर्षमा प्रति 100 रुपैयाँको साधारण ब्याज रू. 12 का दरले आफूसँग भएको रू. 3,00,000 राष्ट्रिय बैंकमा 3 वर्षका लागि जम्मा गरेछन् । (Sunil has deposited Rs.3,00,000 in Rastriya Banijya Bank for 3 years at the rate of Rs.12 simple interest per annum for every 100 rupees.)

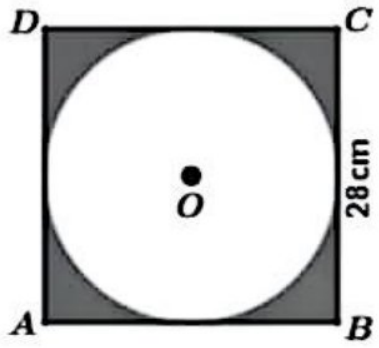
   (a) सुनिलले वार्षिक कति प्रतिशत ब्याजदरमा रकम जम्मा गरेका रहेछन् ?(At what percent of interest rate per annum had Sunil deposited the amount?) [1]

   (b) 3 वर्षपाछि सुनिलले साँवा र ब्याज गरी जम्मा कति रकम पाउँछन् ? गणना गर्नुहोस् । (After 3 years, how much total money does Sunil get with principal and interest? Calculate.) [1]

(c) सुनिलले रू.3,00,000 आफ्ना भाइहरू चन्दन र रामलाई 2:3 को अनुपातमा बाँड्ने निर्णय गरेछन् भने चन्दन र रामले पाउने रकम तुलना गर्नुहोस् । (If Sunil decides to distribute Rs.3,00,000 to his brothers Chandan and Ram in the ratio of 2:3, then compare the amount received by Chandan and Ram.) [2]

4. राजु विराटनगरबाट धरान जान बसमा चढ्छन् । बसको चक्का 1 घण्टामा 35,750 पटक घुम्छ । (Raju takes a Bus to Dharan from Biratnagar. The wheel of the bus rotates 35,750 times in an hour.)
   (a) 35,750 लाई वैज्ञानिक सङ्केतमा लेख्नुहोस् । (Write 35,750 in scientific notation.) [1]
   (b) चक्का 90 मिनेटमा कति पटक घुम्छ होला ?(How many times will the wheel rotate in 90 minutes?) [1]
   (c) $\sqrt{48}+\sqrt{75}-\sqrt{3}$ को मान निकाल्नुहोस् । (Find the value of $\sqrt{48}+\sqrt{75}-\sqrt{3}$) [1]
   (d) $0.\overline{24}$ लाई भिन्नमा रुपान्तर गर्नुहोस् । (Convert $0.\overline{24}$ into a fraction.) [2]

5. सँगै दिइएको चित्रमा ABCD एउटा वर्ग हो र त्यसभित्र एउटा वृत्त खिचिएको छ । (In the given figure alongside, ABCD is a square and a circle is drawn inside it.)



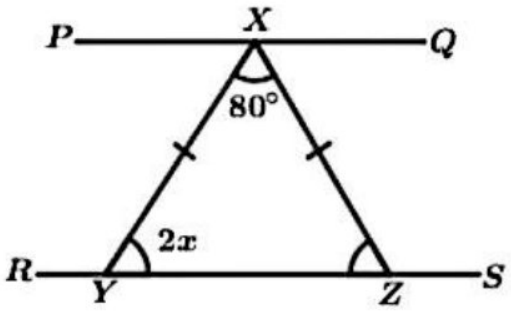
   (a) वृत्तको क्षेत्रफल निकाल्ने सूत्र लेख्नुहोस् । (Write the formula to find the area of circle.) [1]
   (b) उक्त वृत्तको अर्धव्यास कति रहेछ ?(How much is the radius of the circle?) [1]
   (c) छायाँ पारिएको भागको क्षेत्रफल पत्ता लगाउनुहोस् । (Find the area of the shaded region.) [2]
   (d) उक्त वृत्तको परिधि र वर्गको परिमिति तुलना गर्नुहोस् । (Compare the circumference of the circle and perimeter of the square.) [1]

6. (a) $x^m \times x^{-n}$ लाई x को घाताङ्कको रुपमा व्यक्त गर्नुहोस् । (Express $x^m \times x^{-n}$ as power of x.) [1]
   (b) सरल गर्नुहोस् । (Simplify): $\frac{a}{(a-b)^2}-\frac{b}{(a-b)^2}$ [2]

7. (a) युगपत रेखिय समीकरण भन्नाले के बुझिन्छ ?(What is meant by simultaneous equation?) [1]
   (b) लेखाचित्रको प्रयोग गरी दिइएका समीकरणहरूको हल गर्नुहोस् । (Solve the given equations by using graph): $x+y=6$ and $x-y=2$ [2]

8. (a) दिइएका अभिव्यञ्जकहरूको लघुत्तम समापवर्त्य (ल.स.) पत्ता लगाउनुहोस् । (Find the lowest common multiple (LCM) of the given algebraic expressions.)[2]
   $x^2-7x+12$ and $3x^2-27$
   (b) x को मान 2 र 3 हुने वर्ग समीकरण पत्ता लगाउनुहोस् । (Find the quadratic equation in which the values of x are 2 and 3.) [2]

9. सँगैको चित्रमा रेखाखण्डहरू PQ र RS लाई XY र XZ ले छुँदा ΔXYZ बनेको छ । चित्रको अवलोकन गरी तलका प्रश्नहरूको उत्तर दिनुहोस् । (In the adjoining figure, when XY and XZ meet the line segments PQ and RS, a ΔXYZ is formed. Observe the figure and answer the following questions.)



(a) ΔXYZ र ΔXZY बिचको सम्बन्ध लेख्नुहोस् । (Write the relation between ΔXYZ and ΔXZY.) [1]

(b) x को मान पत्ता लगाउनुहोस् । (Find the value of x.) [2]

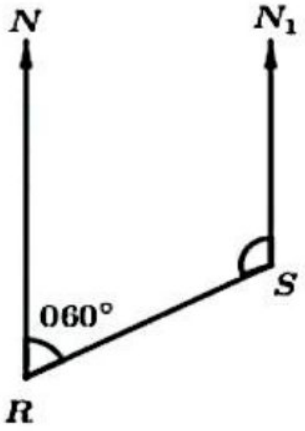
(c) ∡PXY को मान कति भएको अवस्थामा दिइएका रेखाखण्डहरू PQ र RS समानान्तर होलान् ? (At which value of ∡PXY, will the line segments PQ and RS be parallel?) [1]

10. (a) AB = 7 से.मी. र BC = 5 से.मी. हुने गरी आयत ABCD को रचना गर्नुहोस् । (Construct a rectangle ABCD in which AB = 7 cm and BC = 5 cm.) [3]

(b) आयत ABCD मा विकर्ण AC खिंची ΔABC ≅ ΔACD प्रमाणित गर्नुहोस् । (In a rectangle ABCD, prove that triangle ΔABC ≅ ΔACD by drawing a diagonal AC. [3]

11. (a) नियमित टेसेलेसन भन्नाले के बुझिन्छ ? (What is meant by regular tessellation?) [1]

(b) दिइएको चित्रमा R स्थानबाट S स्थानको दिशास्थिति 060° छ भने स्थान S बाट स्थान R को दिशास्थिति कति होला ? पत्ता लगाउनुहोस् । (In the adjoining figure, if the bearing of point S from the point R is 060° then find the bearing of point R from the point S.) [2]



(c) शीर्षबिन्दुहरू M (2, 1), N (4, 3) र O (−1, 2) भएको ΔMNO लाई x-अक्षमा परावर्तन गरी प्रतिबिम्बहरू M' N' र O' को निर्देशाङ्कहरू पत्ता लगाउनुहोस् । (Find the co-ordinates of the images M' N' and O' of the triangle ΔMNO having vertices M (2, 1), N (4, 3) and O (−1, 2) after reflection on x-axis.) [3]

12. शितलले खाने खाजाको मासिक खर्च तलको तालिकामा दिइएको छ । (The monthly expenses of Shital's meals are given in the table below.)

महिना (Month)	असोज (Ashoj)	कार्तिक (Kartik)	मङ्सिर (Mangsir)	पुष (Poush)	माघ (Magh)
खर्च(Expenditure)	Rs.4,000	Rs.2,500	Rs.2,000	Rs.1,700	Rs.1800

(a) शितलले आफ्नो खाजाको लागि गर्ने मासिक औषत खर्च कति रहेछ ?(What is the monthly average expenditure of Shital on her meals?) [1]

(b) शितलको खर्चलाई वृत्तचित्रमा प्रस्तुत गर्नुहोस् । (Present the Shital's expenditure in a pie chart.) [2]

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