



Nalanda College. Colombo

Revelation Test - 2020 Grade 10 – Mathematics

Paper 1

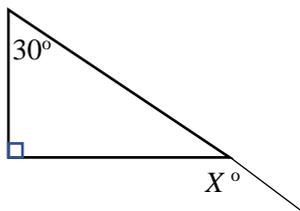
Answer all the questions.

Time – 2 Hours

Part A

1. 10% Duty is charged when importing perfume bottles. Find the amount of duty to be paid when importing a perfume bottle worth Rs10,000/=.

2. Find X

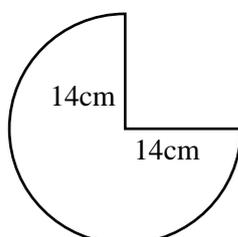


3. Factorise $4a^2 - 1$

4. Express $3^2 = 9$ in logarithm form.

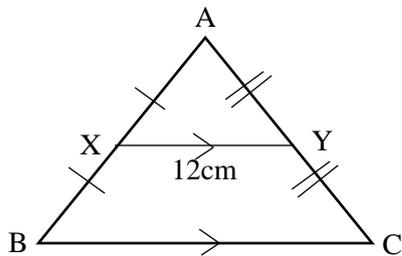
5. 10 workers complete a certain task in 5 days. Find the number of days taken by 5 workers to complete half of that task.

6. Find the perimeter of following sector of the circle.

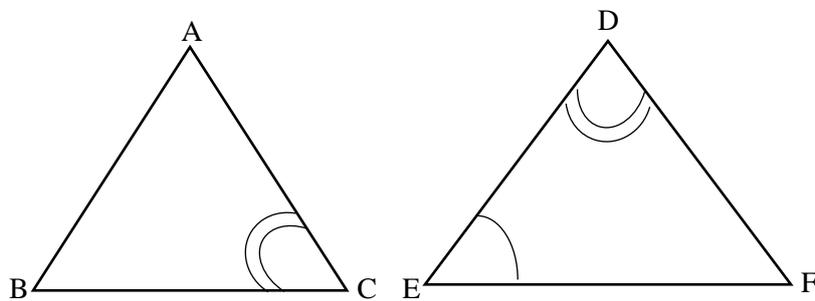


7. Simplify $\frac{3}{x} - \frac{3}{3x}$

8. Find length of BC



9. Mention the angle which needs to be equal, if these triangles are congruent in the case AAS.



10. Mention 541.2 in Scientific notation.

11. Function of a graph is $y = -2x + 4$. Find the gradient and intercept of it.

12. Find the solutions of following equation.

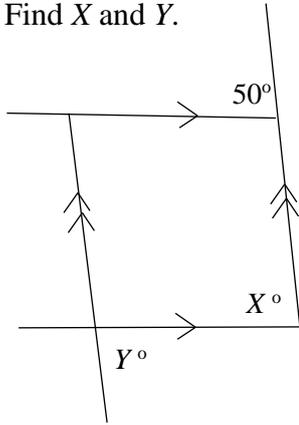
$$x^2 + x - 6 = 0$$

13. If $E = \{1, 2, 3, 4, 5, 6\}$, $A' = \{1, 4, 6\}$, $B = \{2, 4, 6\}$ mention the elements of set A.

14. Find the common difference and 10th term of the following sequence.
100, 90, 80, ...

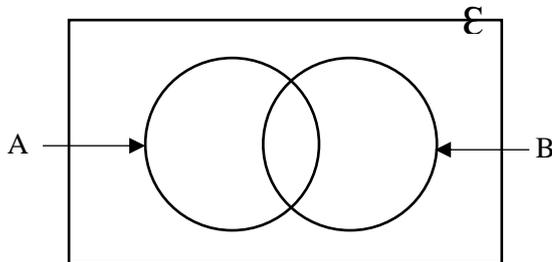
15. Find the least common multiple of $2x^2, 4xy, y^2$.

16. Find X and Y .



17. Evaluate $\lg 25 + \lg 8 - \lg 2$.

18. Shade $(A' \cap B)$ in the following Venn diagram.

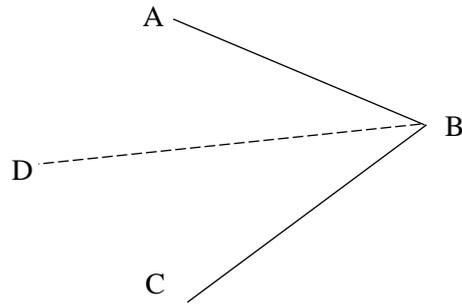


19. The speed of an object which travels at a constant speed is 60km/h. Find the speed in m/s.

20. 3,7,8,7,9
Find the mode of the above data distribution.

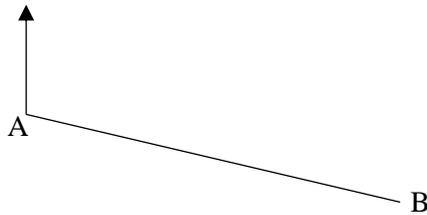
21. In a Right-angled triangle, the ratio between acute angles is 1:2. Find the magnitude of large acute angle.

22. The angle bisector of \widehat{ABC} is BD. Point O is equidistant from AB and BC and 5cm away from B. Mark the point O using your knowledge of loci.



23. Simplify.
$$\frac{3x + 1}{2} = 5$$

24. Bearing of B from A is 120° . Find the bearing of A from B.



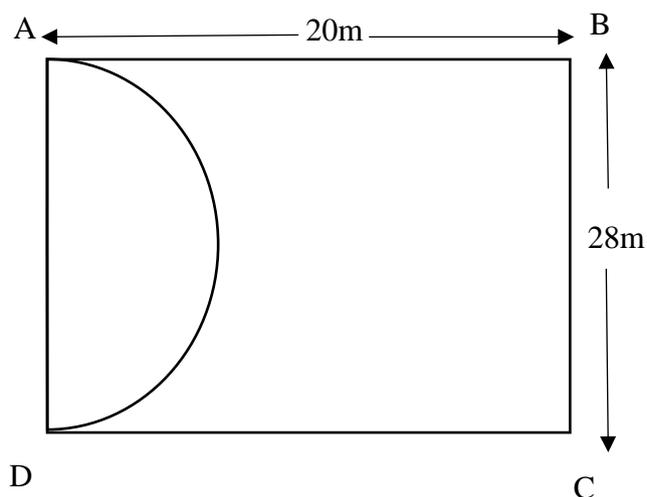
25. There are 25 identical balls in a bag. Some of them are red and others are blue. If the probability of taking a red ball out of the bag is $\frac{3}{5}$, find the number of red balls in the bag.

Part B

1. Sahan gave $\frac{1}{4}$ of toffees he brought from overseas to his brother and $\frac{1}{3}$ to his sister. $\frac{4}{5}$ of the remaining was delivered among his friends and he kept the rest for himself.

- Which fraction of the total toffees was delivered between brother and sister?
- Which fraction of the total was delivered among friends?
- Which fraction of the total he kept for himself?
- If Sahan kept 60 toffees for himself, find the total number of toffees he brought from overseas.

2. Length and breadth of the following rectangular shaped garden are 20m and 28m respectively. There is a semicircular shaped pond at the corner of the garden and the diameter of it is 28m. Rest of the garden is a lawn.



- Find the perimeter of the semicircular part.

b. Find the area of the lawn.

c. Find the ratio between the areas of pond and the lawn.

d. The owner of the garden wants to add a rectangular shaped part to the garden by taking BC as one side of it and as area equal to the semicircular pond. Sketch the rectangular shape in the diagram with measurements.

3. (i). Kamal took Rs.25,000/= loan from a bank at 10% annual simple interest rate. After 3 years he settled the loan by paying Rs 32,500/=.

a. Find the interest he paid for 03 years.

b. Calculate the interest he paid per year.

c. If Kamal took the same loan amount from another financial company (without taking it from the bank) and settled it within 02 years by paying the same interest amount, find the annual interest rate of that financial company.

(ii) 10 Workers are assigned to complete a certain task in 10 days. But in first 5 days only 05 workers attended the workplace. How many more workers needed to complete the task in remaining 05 days.

(4) $\varepsilon = \{X: X \text{ is an integer}, 0 < X < 10\}$

$A = \{\text{Square numbers less than } 10\}$

$B = \{\text{Odd numbers less than } 10\}$

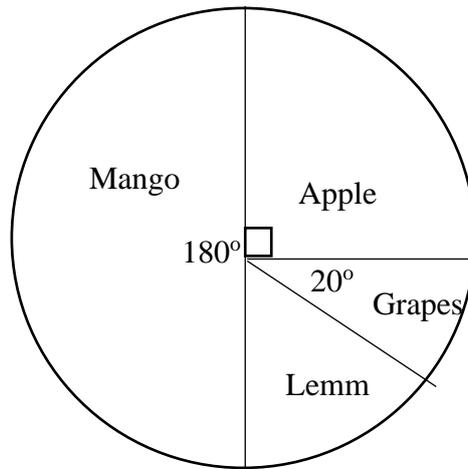
a. Represent above sets in a Venn diagram.

b. Mention the elements of the set $(A \cup B)'$

c. Find $n(B')$

d. Mention the elements of the set $(A \cap B)'$

4. Following Pie chart shows information about favourite fruit of grade 10 students in a certain school.



- Find x°
- What is the favourite fruit of most number of students?
- If 10 students like Grapes, how many students like apple?
- Express the number of students who like Mango as a percentage of the total students.



Nalanda College, Colombo

Revelation Test - 2020

Grade 10 – Mathematics

Part II

Time – 3 Hours

Answer 5 questions from Part A and 5 questions from part B

Part A

1.
 - a. Municipal council charges 4% of the value of the property as rates and the quarterly rates payable on a property is Rs900/=.
 - i. Find the amount has to be paid per year as rates.
 - ii. Find the assessed annual value of the property.
 - b.

Initial Rs.500,000/=	-	Tax free
Next Rs.500,000/=	-	4%
Next Rs.500,000/=	-	8%

 - i. If Piyal's annual income is Rs.1,200,000/= calculate the income tax he has to pay for the year.
 - ii. If Sunimal pays Rs60500/= as income tax for a year calculate his annual income.

2. a. Complete the following table of values to draw the graph of the function $y = -2x^2 + 4$.

X	-3	-2	-1	0	1	2	3
Y	-14	-4	-----	-----	2	-4	-14

- i. Fill in the blanks in the table.
 - ii. By taking 10 small squares along X axis as 1 unit and 10 small squares along Y axis as 2 units draw the graph of the above function.
- b. Using the graph,
 - i. Find maximum value
 - ii. Equation of the symmetrical axis
 - iii. Values of x when y=3
 - iv. The interval of values of x when the function is positive.

3. i. Evaluate

$$\lg 125 + \lg 64 - \lg 8 =$$

- ii. Simplify using a logarithms table.

$$\frac{5.137 \times 0.68.4}{75.47} =$$

- iii. Simplify $(2x - 5)x = 2 = 0$

4.

i. Simplify $\frac{2}{(x-1)} = \frac{4}{(x+2)}$

- ii. Price of 2 pens and 3 books is Rs.240/=. 2 books can be bought for the price of 3 pens. By taking price of a pen as X and price of a book as Y, build up simultaneous equations. Find the price of a book and a pen by simplifying them.

5. a.

- i. Remove brackets and simplify.
 $(3x - 2)(x - 4)$

- ii. Simplify.

$$\frac{2}{3a} + \frac{3}{2a}$$

b.

- i. Factorise
ii. $2x^2 - 3x - 9$
iii. $xy - 4b + xb - 4y$

- c. Find the L:C:M of $4x^2 - 9$ and $x(2x + 3)(x + 4)$.

6. Length, breadth and height of a cuboid shaped tank are 5m,4m and 3m respectively.

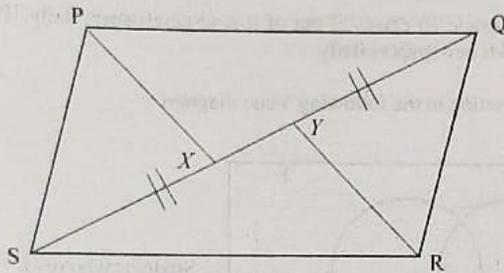
- i. Find the volume of the tank in l.
ii. If water flows in to the tank at a constant rate of 50l per minute find the time taken to fill the tank completely in hours.
iii. Find the height of the water level filled in 90 minutes.

Part B

1. In a number sequence, if $T_n = 22 - 4n$;
 - i. Find first 4 terms
 - ii. Which term is -98
 - iii. Find the common difference.
 - iv. Find $(n+1)^{\text{th}}$ term
 - v. Calculate the number of multiples of 4 between 2 and 150.

2. Construct following using a cm/mm calibrated straight edge and a pair of compasses.
 - i. Construct ABC triangle such that $AB = 6\text{cm}$, $\angle B = 120^\circ$ and $BC = 6.6\text{cm}$.
 - ii. Draw the locus of the point which moves equidistantly from A and B.
 - iii. Draw the locus of the point which moves equidistantly to B and C.
 - iv. Mark the point O where the two loci meet each other.
 - v. Construct the circle by taking OB as the radius and measure the radius.

3. PQRS is a parallelogram and $SX = YQ$.



- i. Show that $\triangle PSX \cong \triangle QRY$.
 - ii. Show that $PX = RY$.
 - iii. Show that PXYR is a parallelogram.
4. A frequency distribution prepared using the data of production of dolls in a factory within 30 days is given below.

Number of Dolls	Mid value (x)	Number of days (f)	fx
10-14		3	
15-19		4	
20-24		7	
25-29		10	
30-34		4	
35-39		2	
		$\Sigma f =$	$\Sigma fx =$

- i. Fill x and fx columns.
- ii. What is the modal class.
- iii. Find the mean daily production of dolls.
- iv. Mention the number of days which passes the daily production of dolls more than 30 as a percentage, within 30 days.

5. In $\triangle ABC$, D and E are mid points of AB and AC respectively. A line drawn parallel to BC through D meets BC produced at F .

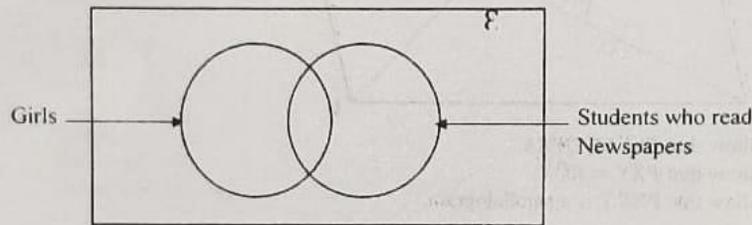
- i. Represent above information in a diagram.
- ii. Show that $\triangle ADE \cong \triangle CFE$.
- iii. Show that $BD = CF$.
- iv. Prove that $BCFD$ is a parallelogram.
- v. Show that $DE = \frac{1}{2}BC$.

6.

a. Give two examples for equivalent sets.

b. There are 42 students in a grade 10 class. 23 out of it read newspapers daily. There are 17 girls in the class and 8 out of it reads newspapers daily.

- i. Represent above information in the following Venn diagram.



- ii. Find the number of students who do not read newspapers.
- iii. Find the number of boys in the class.
- iv. Find the number of boys who do not read newspapers daily.