



NALANDA COLLEGE, COLOMBO 10

FIRST TERM TEST – 2020

GRADE 10

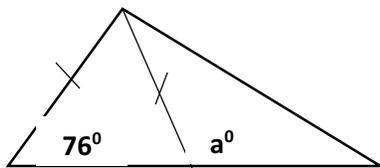
MATHEMATICS – I

Time: 2 hours

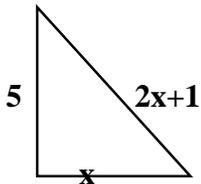
Answer all the questions.

PART A

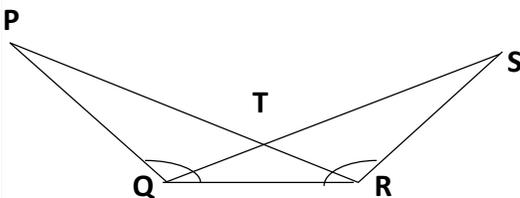
1. Between which two consecutive whole numbers does $\sqrt{21}$ lie?
2. Write 0.0056 in scientific notation.
3. Solve. $\frac{y}{5} = -1$
4. Find the value of a.



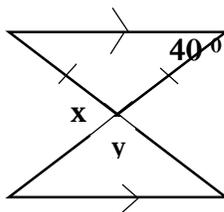
5. If $A^2 = x^2 + y^2 + 2xy$, find the value of A in terms of x and y.
6. Find the perimeter of the triangle in terms of x.



7. Find the factors. $x^2 - 2x - 3$
8. Calculate the diameter of a circle of circumference 20π cm.
9. Expand and simplify. $(a + 3)(a - 4)$
10. In the given figure, $\widehat{PQR} = \widehat{QRS}$. Write a pair of sides that should be equal to make the two triangles congruent under (S.A.S) case.

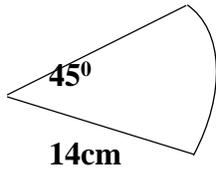


11. According to the data in the figure, find the value of x and y.



12. The amount of food sufficient for 180 soldiers for 8 days has been stored in a certain army camp. Find the total food amount.

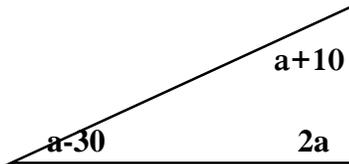
13. A distance that a man walked is $\frac{2}{5}$ of the total distance. If that distance is 12km, what is the total distance of the journey?
14. Price of 3m of lace is Rs.180. Find the price of 5m of lace.
15. Find the area of the sector.



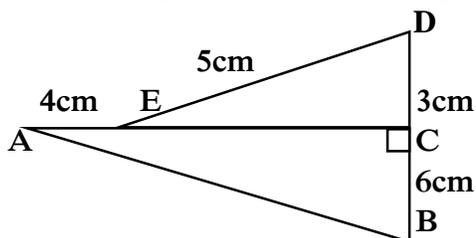
16. Find the least common multiple of $15x^2$, $20(x + 1)$ and $10(x + 1)^2$.
17. The angle of elevation of x when observed from the point Z is 60° . Mark this on the given figure.



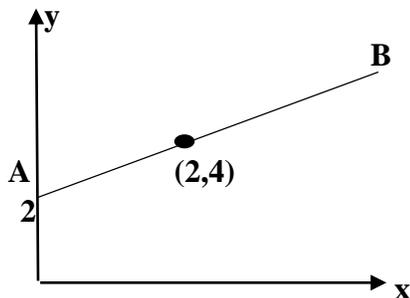
18. Write two positive integral solutions which satisfies the inequality $x+3 < 6$
19. According to the data in the figure, find the value of a.



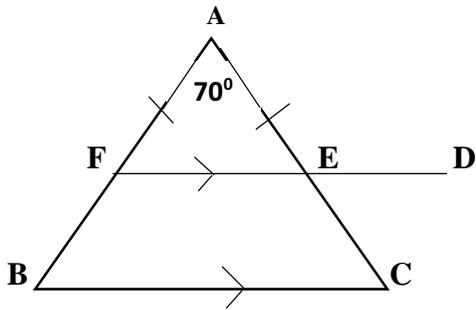
20. Write the sample space for the experiment of drawing a bead from a bag which contains two red beads, four blue beads and three black beads.
21. According to the data in the figure, find the length of AB.



22. Find the gradient of the straight line AB.

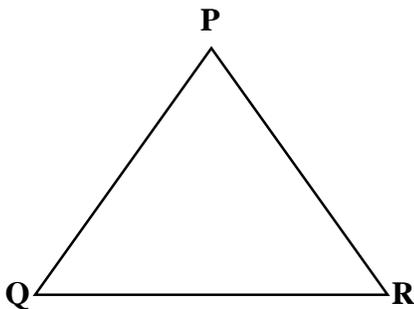


23. Find the magnitude of \widehat{ABC} based on the information marked on the given figure.



24. Using the knowledge of factors, find the value of 98^2

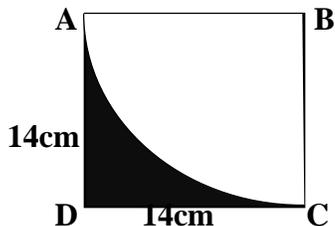
25. The location of a point x which lies on PR and equidistant to PQ and QR is needed to be marked. By showing the relevant construction lines mark the location of x .



PART B

- 1) A farmer sells $\frac{1}{2}$ of his vegetable harvest at whole sale. From the remaining amount $\frac{1}{4}$ is kept for his own consumption. The rest was sold at retail stalls. The income he got from that amount is Rs.9000.
 - i. What is the fraction of the total amount he kept for his own consumption?
 - ii. What is the total fraction of the farmer's own consumption and portion sold at whole sale?
 - iii. What is the fraction of the retail sale?
 - iv. If the retail sale is 300kg, what is the total production?

2) In the figure ABCD is a square and ABC is a sector.

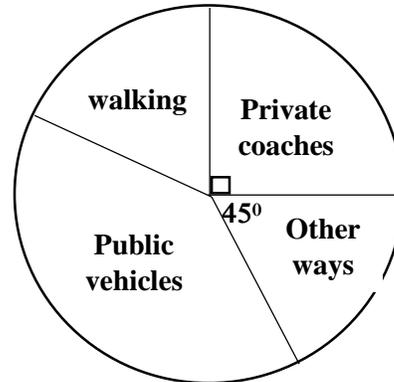


- i. Find the radius of the sector.
- ii. Find the area of the sector.
- iii. Find the perimeter of the shaded part.
- iv. Find the area of the shaded part.

- 3) Sugar, flour and butter are mixed in the ratio 2:5:1 to prepare a certain sweetmeat mixture.
 - a) If the mass of flour used was 10kg, find,
 - i. the mass of sugar
 - ii. the mass of butter in the mixture
 - b) Find the mass of sugar in 4kg of sweetmeat.
 - c) The cost of production of 4kg is Rs.800 and if 1kg can be sold at Rs.600, what is the profit of 1kg.

4) The following table and pie chart provide information on how the teachers of a certain Maha Vidyalaya travel to school.

Mode of transport	Number of teachers
Public vehicles	110
Private coaches	a
Walking	–
Other ways	–



- i. If the total number of teachers in the school is 240, find the value of a.
 - ii. What is the magnitude of the angle at the centre of the sector which denotes public vehicles?
 - iii. Fill in the blanks of the table.
 - iv. What is the angle at the centre which denotes the amount of the teachers by walking?
 - v. 60% of the teachers are women. How many male teachers are there in the school?
- 5) It takes 12 men 20 days to dig a canal. After completing $\frac{1}{5}$ of the task; another 4 men are assigned the work.
- i. What is the magnitude of the task in man days?
 - ii. What is the magnitude of the remaining work in man days after completing $\frac{1}{5}$ of the task?
 - iii. How many days will the labors take to complete the task?
 - iv. If the daily wage of a worker is Rs.1300, find the total amount of money need to pay for all workers.



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MATHEMATICS – II

Time: 3 hours

Answer five questions from part A and five questions from part B.

Part A

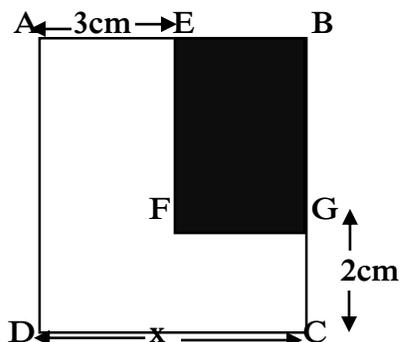
1. a) A carpenter incurs a cost of Rs.30000 in making an almirah which he sells it to a vender at a profit of 10%.
 - i. Find the price at which the vendor bought the almirah.
 - ii. If the vendor earns a profit percentage of 15% by selling it, calculate the selling price of the almirah.
- b) A discount of 12% is offered when a television set of marked price Rs.50000 is purchased.
 - i. How much is offered as the discount?
 - ii. Find the selling price of the television set.

2. An incomplete table prepared to draw the graph of the function $y = \frac{1}{3}x - 2$ is given below.

x	-6	-3	0	3	6
y	-4	-2	0

- i. Fill in the blanks of the table.
 - ii. Draw the graph of the above function.
 - iii. Find the value of x, when y=2.
 - iv. Draw the straight line given by $y = \frac{1}{3}x + 1$ on the same coordinate plane.
 - v. What can you say about these two graphs?
3. a) i. Find the factors of $9x^2 - x^3$.
ii. Using the knowledge of factors, find the value of $92^2 - 8^2$

- b) The figure represents a square lamina and the rectangular shaded part EFGH is cut out.



- i. If $x=6\text{cm}$, find the area of the ABCD lamina.
- ii. Write the length of BE in terms of x .
- iii. Write the length of BG in terms of x .
- iv. Write the area of the BEFG as a product of above expressions.
- v. Find the area of the remaining part in terms of x .

4. a) The capacity of a large apple juice bottle is 3.5 liters. It is expected to serve a quantity of 175ml of this drink in small glasses to each of the guests at a party. If there are 415 guests at the party, find the minimum number of large apple juice bottles needed to serve all the guests.

b) A cuboid shaped container has a square base of area 390cm^2 . An amount of 7.8 liters of water has been filled into this container. Find the height of the water in the container.

5. a) Solve.

i. $\frac{x+3}{5} = 3$

ii. $5a - 1 = 4a + 2$

b) i. The price of three apples and two mandarins is Rs.230. The price of five apples and two mandarins is Rs.350. Taking the price of an apple as Rs. x and the price of a mandarin is Rs. y . Construct two simultaneous equations.

ii. Solve the two equations and find the price of an apple and price of a mandarin.

6. The frequency distribution given below consists of data regarding the mass of a pumpkin harvest.

Mass of one pumpkin kg (f)	Number of pumpkins (x)	fx
4	2	
6	25	
7	3	
8	5	
9	10	
10	5	

- i. What is the mode of the above frequency distribution?
- ii. Fill in the blanks of fx column.
- iii. Find the mean mass of a pumpkin.
- iv. How many pumpkins which are more than 8kg?

Part B

7. a) The general term of a number pattern is $(3n + 2)$.

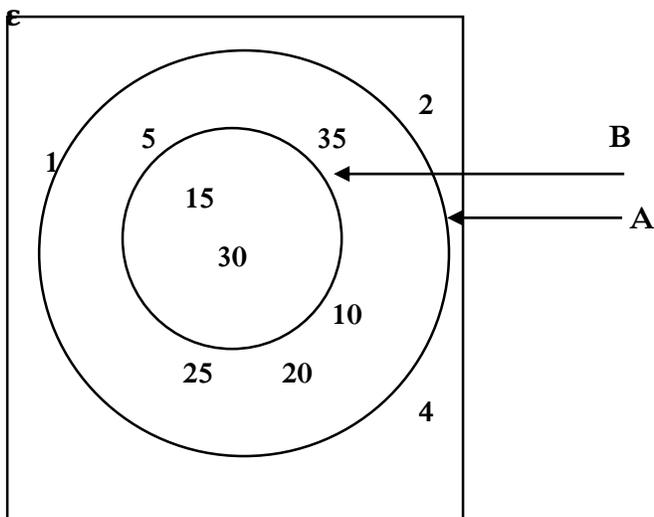
- i. Write the first three terms of this number pattern.
- ii. Find the 12th term.
- iii. Which term is equal to 77?
- iv. Write the $(n+1)$ th term, in terms of n .

b) Find the general term of the number pattern. $-8, -11, -14, -17, \dots$

8. In the following constructions, use only the straight edge with a cm/mm scale and the pair of compasses. Show the construction lines clearly.

- i. Construct the triangle ABC with $AB=6\text{cm}$, $\widehat{ABC}=60^\circ$ and $\widehat{BAC}=90^\circ$.
- ii. Measure and write the length of AC.
- iii. Construct the perpendicular bisector of BC.
- iv. Construct the angle bisector of \widehat{ABC} and name the intersection point of the angle bisector and perpendicular bisector of BC as O.
- v. Construct the circle with the centre O and radius OA.

9. a) Consider the Venn diagram given below.



a) Write each of the following sets in terms of its elements.

- i. $A \cap B$
- ii. $A \cup B$
- iii. A'

b) In a bag, there are 4 red beads, 2 black beads and 3 white beads which are identical in all other aspects. Consider the experiment of randomly drawing a bead from the bag and recording its colour.

- i. Find the probability of drawing a red bead
- ii. Find the probability of drawing either a red bead or a white bead.

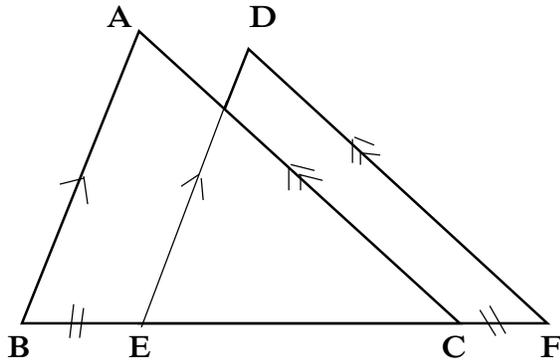
10. A pilot flies a plane 80km on a bearing of 150° and then 150km on a bearing of 200° and arrives at airport B from airport A.

- i. Represent this information in a rough sketch.
- ii. Draw a scale diagram using a suitable scale and find,
 - a) the bearing of B from A
 - b) the distance from A to B
 - c) the bearing of A from B

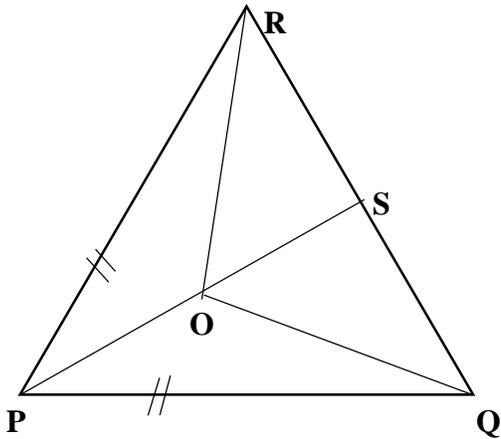
11. In the given figure $AB \parallel ED$, $AC \parallel DF$ and $BE = CF$.

prove that,

- i. $BC = EF$
- ii. $\triangle ABC \cong \triangle DEF$



12. In the triangle PQR, $PR = PQ$, $\widehat{PRO} = \widehat{QRO}$ and $\widehat{RQO} = \widehat{PQO}$. PO produced meets RQ at S.



- i. Prove that,
 - a) $OR = OQ$
 - b) $\widehat{ROP} = \widehat{QOP}$
- ii. If \widehat{PRQ} is x° , giving reasons find the value of the following angles in terms of x .
 - a) \widehat{QRO}
 - b) \widehat{ROQ}
 - c) \widehat{RPQ}