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SET NO. 2



INDIAN SCHOOL MUSCAT MID TERM EXAMINATION MATHEMATICS

CLASS: X

Sub. Code: 041

Time Allotted: 3 Hrs

10.05.2018

Max. Marks: 80

General Instructions:

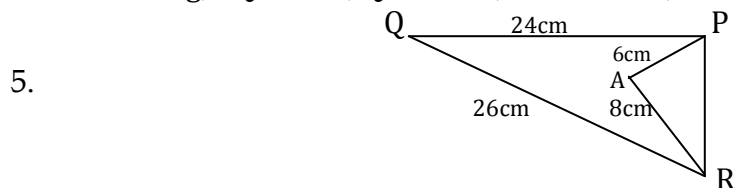
- (i) All questions are compulsory.
- (ii) The question paper consists of 30 questions divided into four sections A, B, C and D.
- (iii) Section A contains 6 questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 10 questions of 3 marks each. Section D contains 8 questions of 4 marks each.
- (iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculators is not permitted.

SECTION A

Question numbers 1 to 6 carry 1 mark each

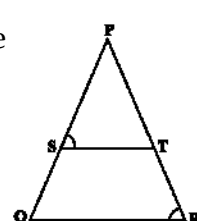
1. At what point will the line $x - y = 8$ intersect y -axis.
2. Find the value(s) of k for which the system of equations $4x - 2y = 3$; $3x + ky = 1$ has unique solution.
3. Determine the AP whose 3rd term is 5 and the 7th term is 9.
4. Find the 5th term from the end of the A.P: 17, 14, 11, ... , - 40.

In the fig, $PQ=24\text{cm}$, $QR=26\text{cm}$, $\angle PAR=90^\circ$, $PA = 6\text{cm}$ and $AR = 8\text{cm}$. Find $\angle QPR$.



In the figure, $\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle PST = \angle PRQ$. Prove that PQR is an isosceles triangle

6.



SECTION B

Question numbers 6 to 12 carry 2 marks each

7. A father is three times as old as his son. After five years, his age will be two and half times as old as his son. Represent this situation algebraically only.
8. Papa would require Rs.5000 for getting her daughter admitted in a school after a year. She saved Rs.150 in the first month and then increased her monthly savings by Rs.50 every month. Find, if she will be able to arrange the required money after 12 months. Which value is reflected in her efforts?
9. In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third, and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed?
10. Using Basic proportionality Theorem, prove that a line drawn through the mid-point of one side of a triangle parallel to another side bisects the third side.
11. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$
12. Let $\Delta ABC \sim \Delta DEF$ and their areas be, respectively, 64 cm^2 and 121 cm^2 . If $EF = 15.4 \text{ cm}$, find BC.

SECTION C

Question numbers 13 to 22 carry 3 marks each

The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

13. **OR**

Solve $2x + 3y = 11$ and $2x - 4y = -24$ and hence find the value of 'm' for which $y = mx + 3$.

14. Solve the pair of linear equations graphically: $4x - y - 8 = 0$ and $2x - 3y + 6 = 0$. Also, determine the vertices of the triangle formed by these lines and x-axis.

Solve the following pair of equations by reducing them to a pair of linear equations :

15. $\frac{5}{x-1} + \frac{1}{y-2} = 2$; $\frac{6}{x-1} - \frac{3}{y-2} = 1$

16. Find the sum of first 24 terms of the list of numbers whose nth term is given by $a_n = 3 + 2n$

Which term of the AP: 3, 15, 27, 39 . . . will be 132 more than its 54th term?

17. **OR**

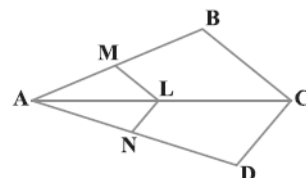
The first and the last terms of an AP are 17 and 350 respectively. If the common difference is 9,

how many terms are there and what is their sum?

18. Find the sum of all the two digit natural numbers which are divisible by 4.

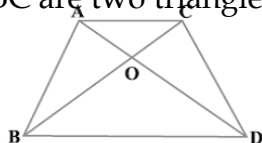
19. In $\triangle ABC$, AD is perpendicular BC. $AD^2 = BD \times DC$. Prove that $\triangle ABC$ is a right angled triangle

20. In the given figure, if $LM \parallel CB$ and $LN \parallel CD$, prove that $\frac{AM}{AB} = \frac{AN}{AD}$



In the figure, ABC and DBC are two triangles on the same base BC. If AD intersects BC at O,

show that $\frac{ar(\triangle ABC)}{ar(\triangle DBC)} = \frac{AO}{DO}$



21.

OR

D, E and F are respectively the mid-points of sides AB, BC and CA of $\triangle ABC$. Find the ratio of the areas of $\triangle DEF$ and $\triangle ABC$.

22. An aeroplane leaves an airport and flies due north at a speed of 1000 km per hour. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200 km per hour. How far apart will be the two planes after $1\frac{1}{2}$ hours?

SECTION D

Question numbers 23 to 30 carry 4 marks each

23. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km down-stream. Determine the speed of the stream and that of the boat in still water.

24. The taxi charges in a city consist of a fixed charge together with the charge for the distance covered. For a distance of 10 km, the charge paid is Rs 105 and for a journey of 15 km, the charge paid is Rs 155. What are the fixed charges and the charge per km? How much does a person have to pay for travelling a distance of 25 km?

Solve for x and y :

$$\frac{1}{3x+y} + \frac{1}{3x-y} = \frac{3}{4}; \frac{1}{2(3x+y)} - \frac{1}{2(3x-y)} = \frac{-1}{8}$$

25.

OR

90% and 97% pure acid solutions are mixed to obtain 21 litres of 95% pure acid solution. Find

the amount of each type of acid to be mixed to form the mixture.

26. 2 women and 5 men can together finish an embroidery work in 4 days, while 3 women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the work, and also that taken by 1 man alone.

27. If the sum of the first n terms of an AP is $4n - n^2$ what is the first term (that is S_1)? What is the sum of first two terms? What is the second term? Similarly, find the 3rd, the 10th and the n th terms

28. Find the sum of first 22 terms of an AP in which $d = 7$ and 22nd term is 149.

Prove that, If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

29. **OR**

Prove that, The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides

BL and CM are medians of a triangle ABC right angled at A. Prove that $4(BL^2 + CM^2) = 5 BC^2$.

OR

30. Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that $\Delta ABC \sim \Delta PQR$.

End of the Question Paper