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Code Number 041/2



INDIAN SCHOOL MUSCAT
SECOND MIDTERM EXAMINATION 2017
MATHEMATICS

CLASS: IX

Sub. Code: 041

Time Allotted: 3 Hrs

11.12.2017

Max. Marks: 80

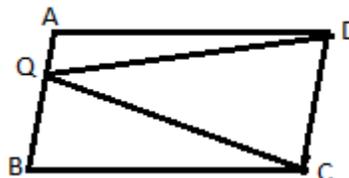
General Instructions:

- (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 (6 x 1 = 6)

1. Simplify : $m^{a-b} \times m^{b-c} \times m^{c-a}$
2. If $p(x) = 10x - 4x^2 - 3$, find $p(-1)$.
3. State any two Euclid's axioms
4. State converse of Mid-point Theorem.
5. A student says median of 3, 14, 8, 18, 20, 5 and 17 is 18. Is he right or wrong? Justify your answer.
6. ABCD is a parallelogram with area 84 cm^2 and Q is any point on the side AB.

Find the value of $\text{ar}(\Delta QAD) + \text{ar}(\Delta QBC)$

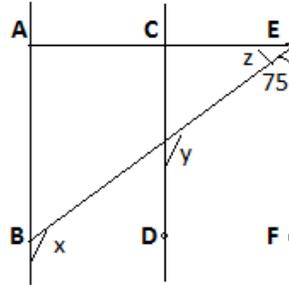


SECTION – B (6 x 2 = 12)

7. In the given figure, if $AC = BD$, then prove that $AB = CD$.



8. In the given figure, $AB \parallel CD$, $CD \parallel EF$ and $EA \perp AB$. If $\angle BEF = 75^\circ$, then find the values of x, y, z .



9. Plot a point $P(2, 4)$ in the Cartesian plane. Now plot the reflections of this point in X and Y axis and denote them as Q and R, respectively. Name the type of triangle PQR so formed.
10. If $x = a - 1$ and $y = 2a$ is the solution of the linear equation $3x + 2y + 7 = 0$ then find the value of **a**.
11. Diagonals of a quadrilateral ABCD bisect each other.
If $\angle A = 45^\circ$, then $\angle B = 145^\circ$. Is it true? Justify your answer.
12. Find the mean of first 10 prime numbers.

SECTION – C (10 x 3 = 30)

13. Represent $\sqrt{8.7}$ on a number line

OR

Express $3.14\bar{5}$ in $\frac{p}{q}$ form; where p and q are non zero integers.

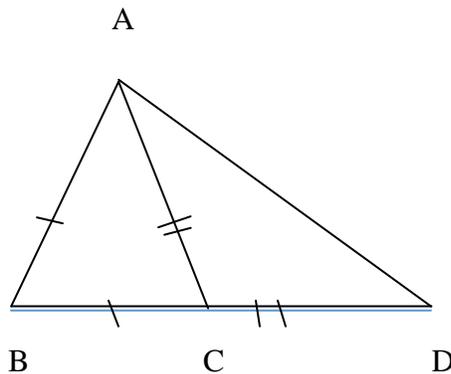
14. Factorize the following : $27a^3 - \frac{9}{2}a^2 + \frac{1}{4}a - \frac{1}{216}$

OR

Using suitable identity show that $\frac{0.75 \times 0.75 \times 0.75 + 0.25 \times 0.25 \times 0.25}{0.75 \times 0.75 - 0.75 \times 0.25 + 0.25 \times 0.25} = 1$

15. In the given figure, $AB = BC$ and $AC = CD$.

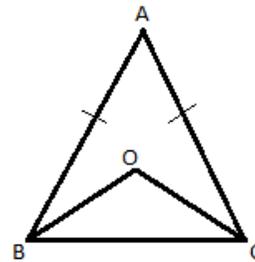
Prove that $\angle BAD : \angle ADB = 3 : 1$.



16. a) If sides of an equilateral triangle is 'a' units then write the area of this triangle.
 b) In an equilateral triangle the length of one of its median is 6 cm then find the area of the triangle.

17. In an isosceles $\triangle ABC$, $AB = AC$ and bisectors of internal angles B and C meet at O. Show that

(i) $OB = OC$ (ii) OA bisects angle A.

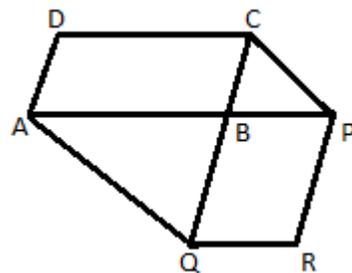


18. Prove that line segment joining the midpoints of two sides of a triangle is parallel to third side and equal to half of it.
 19. Diagonal AC of a parallelogram ABCD bisects $\angle A$. Show that
 (i) It bisects $\angle C$ also.
 (ii) ABCD is a rhombus.

OR

Prove that if diagonals of parallelogram are equal, then it is a rectangle.

20. The side AB of a parallelogram ABCD is produced to any point P. A line through A parallel to CP meets CB produced in Q then parallelogram PBQR is completed.



and the

Show that $\text{ar}(\text{//gm ABCD}) = \text{ar}(\text{//gm BPRQ})$.

21. In $\triangle ABC$, E is the mid-point of the median AD. Show that $\text{ar}(\triangle BED) = \frac{1}{4} \text{ar}(\triangle ABC)$.

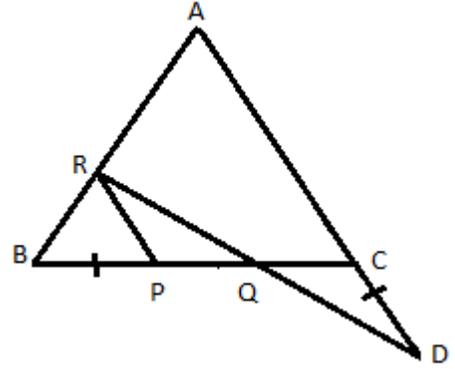
OR

Show that diagonals of a parallelogram divide it into four triangles of equal areas.

22. a) The mean of 10, 12, 16, 20, p and 26 is 17. Find the value of p.
 b) The following observations have been arranged in ascending order. If the median of the data is 23.5, find the value of x.
 12, 16, 17, 19, x, x+3, 37, 38, 40, 43.

SECTION – D (8 x 4 = 32)

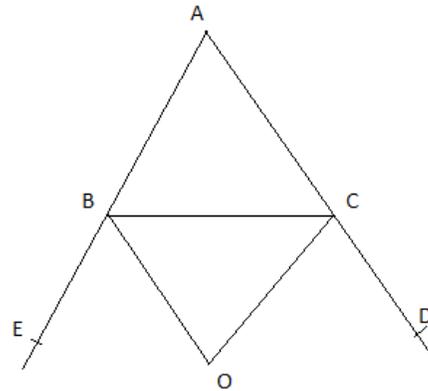
23. In the given figure, $\triangle ABC$ is an equilateral triangle in which $PR \parallel AC$. AC is produced to D such that $CD = BP$, then prove that PC is bisected by RD at Q .



24. Given $\sqrt{2} = 1.414$ and $\sqrt{6} = 2.449$. Find the value of $\frac{1}{\sqrt{3}-\sqrt{2}-1}$ correct to three decimal places.
25. If $x^2 + \frac{1}{x^2} = 34$ and taking only positive value of $x + \frac{1}{x}$, find the value of $x^3 + \frac{1}{x^3}$.

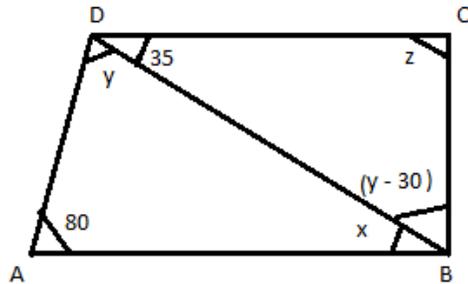
26. In the given figure, bisectors of the exterior angles B and C intersect each other at O .

Prove that $\angle BOC = 90^\circ - \frac{1}{2} \angle A$



OR

In the given figure, $AB \parallel DC$,
 $\angle BDC = 35^\circ$ and $\angle BAD = 80^\circ$.
 Find x , y and z .



27. In a class number of boys are more than number of girls and difference between number of girls and boys in the class is 10.
- Represent this situation in form of linear equation in two variables.
 - Draw the graph of the linear equation formed above.
 - Using the graph find the number of girls, if number of boys is 20.

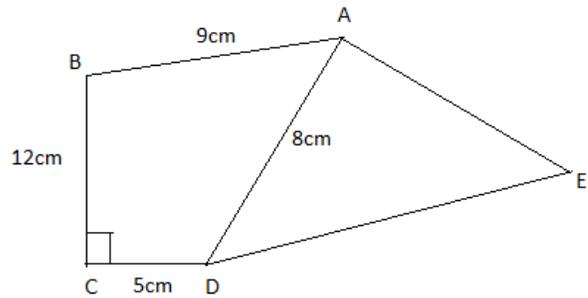
28. A model of a park has the shape as

shown in the figure where

$CD = 5\text{cm}$, $BC = 12\text{cm}$, $AB = 9\text{cm}$,

$AD = 8\text{cm}$ and $\triangle ADE$ is an equilateral triangle.

Find the area of the model.



29. A random survey of the number of children of various age groups playing in a park is given in the table. On the graph draw a histogram to represent the data.

Age(in years)	Number of children
1 – 2	5
2 – 3	3
3 – 5	6
5 – 7	12
7 – 10	9
10 – 15	10
15 – 17	4

30. Following is the number of cars passing by side of a café on highway in a particular time over a period of 15 days.

12, 10, 14, 16, 18, 15, 12, 16, 12, 14, 19, 15, 10, 14, 12.

- Represent the data in form of grouped frequency table with equal class width taking the first interval as 10 – 12 such that 10 is included and 12 is not included.
- Hence or otherwise find the median and mode of the data.

OR

The mean of the following distribution is 50.

Find the value of 'a'.

x	10	30	50	70	90
f	17	$5a + 3$	32	$7a - 11$	19

End of the Question Paper