Code No. 041

PRE-BOARD EXAMINATION, FEBRUARUY-2018

CLASS: X Div: ____ **MATHEMATICS** **Time: 3 hrs.**

Date……. **MAX. MARKS: 80**

Name…… **Roll No…….**

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) *Use of calculators is not permitted.*

SECTION A

Question numbers 1 to 6 carry 1 mark each

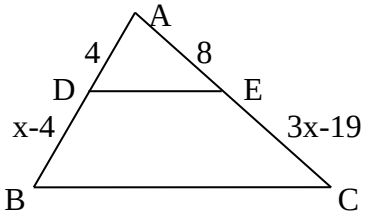
1. If $\text{LCM}(26,169) = 338$, then find the $\text{HCF}(26,169)$? 1

2. Find a quadratic polynomial if the sum and product of its zeroes are $\frac{1}{5}, -3$ respectively. 1

3. In an AP if $d = 0, n = 107, a = -2.5$ then find a_n? 1

4. Find the coordinates of the point on y-axis which is nearest to the point $(-3,2)$. 1

5. In the given figure if $DE \| BC$, then find the value of x? 1



6. If $\tan\theta = \sin 30^0 + \cos 45^0 \sin 45^0$, then find the value of θ? 1

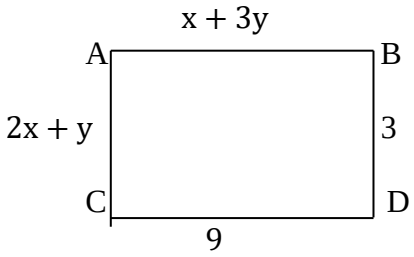
SECTION B

Question numbers 7 to 12 carry 2 marks each.

7. Use Euclid's division algorithm to find the HCF of 1260,7344 2

8. If the probability of winning a game is 0.7, what is the probability of losing it? 2

9. Find the value of x and y in the given figure showing a rectangle? 2



10. If the distance of the point P(x, y) from the points A (5, 1) and B (-1, 5) is equal, show that $3x = 2y$. 2

11. A bag contains 5 red balls, 8 white balls, 4 green balls and 7 black balls. A ball is drawn at random from the bag. Find the probability that it is not green? 2

12. Find the value of k for which $(3k + 4), 7k$ and $(9k + 4)$ are in A. P. 2

SECTION C

Question numbers 13 to 22 carry 3 marks each

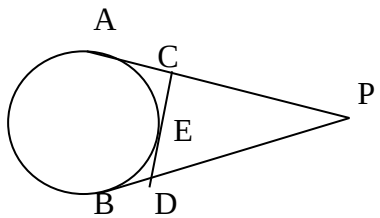
13. Is square root of every non-square number always irrational? Find the smallest natural number which divides 2205 to make its square root a rational number? 3

14. Obtain all zeroes of the polynomial $2x^4 - 10x^3 + 5x^2 + 15x - 12$, if two of its zeroes are $\sqrt{\frac{3}{2}}, -\sqrt{\frac{3}{2}}$ 3

15. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, find the numbers? 3

16. Prove that any line parallel to parallel sides of a trapezium divides the non parallel sides proportionality (i.e., in the same ratio). 3

17. From an external point P, tangents PA and PB are drawn to a circle with centre O. If CD is the tangents to the circle at a point E and PA=14cm, find the perimeter of triangle PCD? 3



18. Prove the following identities, where the angles involved are acute angles for which the expressions are defined 3
$(\sin A + \text{cosec } A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

19. Vihaan divided a pizza of diameter 21cm into eight equal sectors and distributed them among his friends. Calculate 3
    (i) Angle of each sector.
    (ii) Area of each sector.

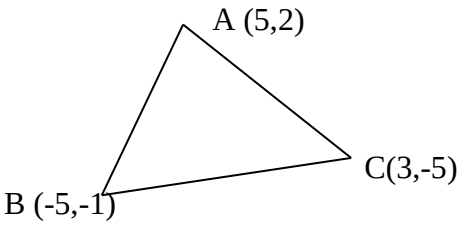
20. A cylindrical tub, whose diameter is 12cm and height 15cm, is full of ice-cream. The whole ice-cream is to be divided into 10 children in equal ice-cream cones, with conical base surmounted by hemispherical top. If the height of conical portion is twice the diameter of base, find the diameter of conical part of ice-cream cone. 3

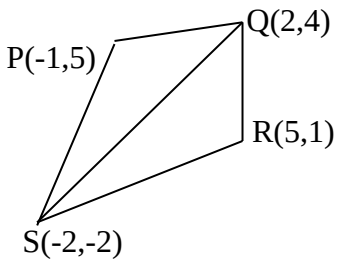
21. The following distribution gives the daily wages of workers of a factory. Find the mean daily wages of a worker. 3

Daily wages	More than 300	More than250	More than200	More than150	More than100	More than50	More than0
No. of workers	0	12	21	44	53	59	60

22. Kiran wants to purchase a plot of land. He has the choice of buying any one of the two plots available at the same cost, as shown in the figures. 3

(i) Find the area of two plots?
(ii) Kiran decides to purchase triangular plot. Why?





SECTION D

Question numbers 23 to 30 carry 4 marks each.

23. Two poles of equal heights are standing opposite to each other on either side of the road which is 80m wide. From a point P between them on the road, the angle of elevation of the top of a pole is 60^0 and the angle of depression from the top of another pole at point P is 30^0. Find the heights of the poles and the distances of the point P from the poles? 4

24. Construct a triangle ABC in which AB=5cm , BC=6cm and AC=7cm .Now construct another triangle similar to triangle ABC such that each of its sides is $\frac{3}{5}$ of the corresponding side of triangle ABC 4

25. The median of the following data is 52.5.Find the values of x and y ,if the total frequency is 100 4

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Freq	2	5	x	12	17	20	y	9	7	4

26. An observer 1.5m tall is 28.5m away from a tower 30m high. Determine the angle of elevation of the top of the tower from his eye? 4

27. The height of a cone is 40cm. A small cone is cut off at the top by a plane parallel to the base. If its volume be $\frac{1}{64}$ of the volume of the given cone, at what height above the base is the section made? 4

28. Find the sum of all two digit odd positive numbers? 4

29. Prove that the ratios of the areas of two similar triangles are equal to the ratio of the squares of their corresponding sides? 4

30. Show graphically that the pair of equations $3x - y = 2$; $9x - 3y = 6$ has infinitely many solutions. 4

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