CLASS X
SAMPLE PAPER
MATHS

SECTION A

1. If (1-sin2β)-cos2β
   (i) 0 (ii) 1 (iii) tan2β (iv)cos2β
2. Evaluate $\tan^2 30^0 \sin 30^0 + \cos 60^0 \sin^2 90^0 \tan^2 60^0 - 2\tan 45^0 \cos^2 0^0 \sin 90^0$.
3. Find the greatest number, which on dividing 1657 & 2037 leaves rem 6 & 5 respectively.
   (i)127 (ii) 172 (iii) 271 (iv) 217
4. ABC & BDE are two equilateral triangles such that D is the mid point of BC. Find the ratio of the areas of Δ ABC Δ BDE
5. The equations x-y=0.9 & $\frac{11}{x+y} = 2$ have the solutions
   (i)x=5, y=9 (ii) x=3.2, y=2.3 (iii) x=3, y=2 (iv) None.
6. A circle of radius 2cm, if the diameter of circle is increased by 100%, then the area will be increased by
   (i) 300% (ii) 400 % (iii) 500% (iv) 600%.
7. Find the area of the largest circle that can be drawn inside a ertectangle of sides 7m x 3.5m
   (i) 77/2 m^2 (ii) 77 m^2 (iii) 77/8 m^2 (iv)77/4 m^2
8. A tangent PQ at a point P of a circle of radius 7cm meets a line through centre O at a point Q so that OQ=25cm find the length of PQ_____.
9. A toothed wheel of diameter 50cm is atttatched to a smaller wheel of diameter 30cm. How many revolutions will the smaller wheel will make which the larger one makes in 15 revolutions.
   (i) 23 (ii) 24 (iii) 25 (iv) 26

10. If in two triangles DEF & PQR, √$\angle D = \angle Q$ & $\angle R = \angle E$ then which of the following is not true

(i) $\frac{EF}{PR} = \frac{DF}{PQ}$ (ii) $\frac{DE}{PQ} = \frac{FE}{RP}$ (iii) $\frac{DE}{QR} = \frac{DF}{PQ}$ (iv) $\frac{EF}{RP} = \frac{DE}{QR}$

11. The medians of a right triangle which are drawn from the vertices of the acute angles are 5cm & 2√10cm. Find the length of the hypotenuse

(i) 10 cm (ii) 2√40cm (iii) √13 cm (iv) 2√13 cm

12. If $\frac{3+5+7+...+upto\ n\ terms}{5+8+11+...+upto\ 10\ terms} = 7$ then find the value of n.

13. Prove that $\left(\frac{1+\sin\theta-\cos\theta}{1+\sin\theta+\cos\theta}\right)^2 = \frac{1-\cos\theta}{1+\cos\theta}$

14. A cone, a hemisphere & a cylinder stand on equal bases & stand on equal bases & have the same height. Find the ratio of their volumes

(i) 3 : 4 (ii) 5 : 3 (iii) 27 : 20 (iv) 20 : 27

15. There are two concentric circles with centre O & radii 5cm & 3cm. PA & PB are tangents to these circles from an external point P. If PA=12cm, then find the length of PB

(i) 10 (ii) 4√10 (iii) 12 (iv) √178.

16. The area of rectangle gets reduced by 80 sq. units if its length is reduced by 5 units & the breadth is increased by 2 units. If we increase the length by 10 units & decrease the breadth by 5 units, the area is increased by 50 sq. units. Find the length & breadth of the rectangle.

17. If the points (a, 0) (0, b) & (3, 2) are collinear, Find the value of

(i) 0 (ii) 1 (iii) ½ (iv) 2

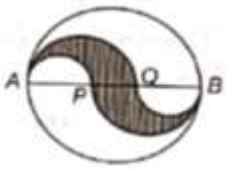
18. If the mean & median is 10 & 8 respectively, then find the mode of the observation.

19. The probability of 53 Sundays in a leap year_____.

20. OPQR is a rhombus, three of whose vertices lie on a circle with centre O. If the area of a rhombus is $32\sqrt{3}cm^2$, find the radius of the circle.

Or

Diameter AB 12 cm long AB is trisected at P and Q. Find the area of the shaded region.



Section B

21. If HCF (65, 117) is expressed in the form 65m+117n. Find the value of 'm'.

Or

The length, breadth & height of a room are 7m 65 cm, 5 m 85 cm & 4 m 95 cm, respectively. Find the length of the longest rod which can measure the dimensions of the room exactly.

22. Solve for x : -4+(-1)+2+.....+x=437

23. Which term of the AP 22, 19, 16,..... is the first negative term

24. Solve the following equation for θ : $\frac{\cos^2\theta}{\cot^2\theta-\cos^2\theta}=3$

25. The median of the following is 525, Find x & y if total frequency is 100.

Class intervals	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
frequency	2	5	X	12	17	20	y	9	7	4

26. **A building is in the form of a cylinder surrounded by a hemispherical vaulted dome and contains 41 $\frac{19}{21}$ cu m of air. If the internal diameter of the building is equal to its total height above the floor, find the height of the building.**

Section C

27. On dividing the polynomial $4x^4 - 5x^3 - 39x^2 - 46x - 2$ by the polynomial g(x), the quotient is $x^2 - 3x - 5$ & the remainder is -5x+8. Find the polynomial g(x).

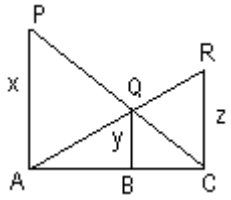
28. 3/8th of the students of a class opted for visiting an old age home. Sixteen students opted for having a nature walk. Square root of the total number of students in the class opted for tree plantation in the school. The number of students who visited an old age home is same as the number of students who went for nature walk & did tree plantation. Find the total number of students

29. The minimum age of children to be eligible to participate in a painting competition is 8 years. It is observed that the age of the youngest boy was 8 years & the ages of rest of the participants are having a common difference of 4 months. If the sum of all participants is 168 years. Find the age of eldest participant in the painting competition.

OR

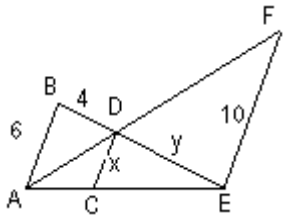
The sum of four consecutive numbers in an AP is 32 & the ratio of product of the first & last term to the product of two middle terms is 7:15. Find the numbers.

30. PA, QB & RC are each $\perp$ to AC. Prove that $\frac{1}{x} + \frac{1}{z} = \frac{1}{y}$.



OR

AB || CD || EF. If AB=6cm, CD=xcm EF=10cm, BD=4cm & DE=y cm, Calculate the values of x & y.



31.Solve for x : $\frac{1}{a+b+x}=\frac{1}{a}+\frac{1}{b}+\frac{1}{x}$

32.P & Q are two points whose coordinates are (at2, 2at) & $(\frac{a}{t^2},\frac{-2a}{t})$ respectively & S is the point (a, 0) Show that $\frac{1}{SP}+\frac{1}{SQ}$ is independent of t.

OR

A(6, 1) B(8, 2) & C(9, 4) are the three vertices of parallelogram ABCD. If E is the mid-point of DC, then find ar Δ ADE.

33.If $\operatorname{cosec}\theta-\sin\theta=l$ & $\sec\theta-\cos\theta=m$ Show that $l^2m^2\left(l^2+m^2+3\right)=1$

Or

34.Prove the following identity $\frac{1}{\cot^2\theta}+\frac{1}{1+\tan^2\theta}=\frac{1}{1-\sin^2\theta}-\frac{1}{\operatorname{cosec}^2\theta}$

35.The median of the following data is 52.5. Find the values of 'x' & 'y' if the total frequency is 100,

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

Or

A jar contains 3000 white, black & red balls The balls are thoroughly mixed & a sample of 60 taken the sample is found to contain 17 white balls, 32 black balls & 11 red balls. Estimate the number of balls of each colour in the jar.

Section D

36. Show that one & only one out of n, n+4, n+8, n+12 & n+16 is divisible by 5, where n is any positive integer.

OR

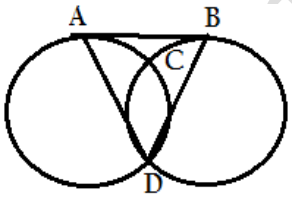
A mason has to fit bathroom with square tiles of the largest possible size. The size of the bathroom is 10ft by 8ft. What would be the size in inches of the tile required that has to cut & how much such tiles are required.

37. a railway Half Ticket costs half the full fare but the reservation charges are same on Half Ticket as on full ticket One reserved first class ticket from station A to B costs Rs 2,125 Also 1 reserved full first class ticket and 1 reserved half first class ticket from A to B costs rupees 3,200 find the full fare from station A to B and also the reservation charges for the ticket

OR

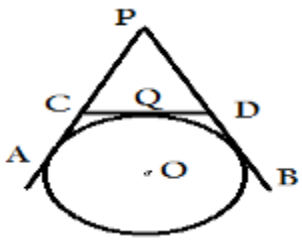
If in a rectangle the length is increased and breadth is reduced each by 2 metres the area is reduced by 28 metre if the length is reduced by 1 metre and the breadth is increased by 2 metre, the area increases by 33 square metre find the length and breadth of the rectangle

38. AB is common tangent to two circles that intersect at C & D. AD is tangent to smaller circle & BD is tangent to larger circle Find ∠ADB.



OR

PA & PB are tangents to the circle from point P. CD is another tangent touching circle at Q. If PA=12cm, QC=QD=3cm, find PC+PD.



39. The angle if elevation if a jet fighter from a point P on the ground is 60°. After 15 second flight the angle of elevation is 30°. If jet is flying at a speed of 720 km / hour, find the height at which jet is flying.

OR

A school has 5 houses ABCDE. A class has 23 students, 4 from house A, 8 from house B, 5 from house C, 2 from house D & rest from house E. A single student is selected at random to be the class monitor. The probability that selected student is not from A, B & C

40. A hollow cone is cut by the plane parallel to the base & upper portion is removed If the CSA of remainder is 8/9 of the CSA of the whole cone Find the ratio of line segments into which cone's altitude is divided by the plane.

OR

The height of cone is 30cm A small cone is cut off at the top by the plane parallel to the base if its volume is 1/27 of the volume of given cone. At what height above the base the section is cut.

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