



MATHS

BOOKS - VK GLOBAL PUBLICATION MATHS (HINGLISH)

MODEL QUESTION PAPER - 1

Section A

1. Write the condition to be satisfied by q so that a rational number $\frac{p}{q}$ has a terminating decimal expansion.

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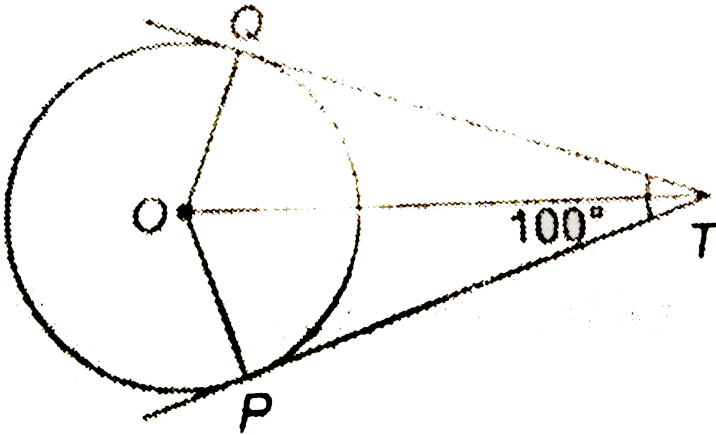
2. For what value of k , the following pair of linear equations has infinitely many solutions? $10x + 5y - (k - 5) = 0$, $20x + 10y - k = 0$

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3. Find the common difference of an AP in which $a_{16} - a_{12} = 16$.

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4. Two tangents TP and TQ are drawn from an external point T to a circle with centre O as shown in figure. If they are inclined to each other at an angle of 100° , then what is the value of $\angle POQ$?



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5. A bag contains 5 red and 4 black balls. A ball is drawn at random from the bag. What is the probability of getting a black ball ?



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Section B

1. Find the HCF of 96 and 404 by prime factorisation method. Hence, find their LCM.



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2. Find the zeros of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relationship between the zeros and the coefficients of the polynomial.



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3. If $x = \frac{2}{3}$ and $x = -3$ are the roots of the quadratic equation $ax^2 + 7x + b = 0$ then find the values of a and b.

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4. Without using the trigonometric tables, evaluate the following :

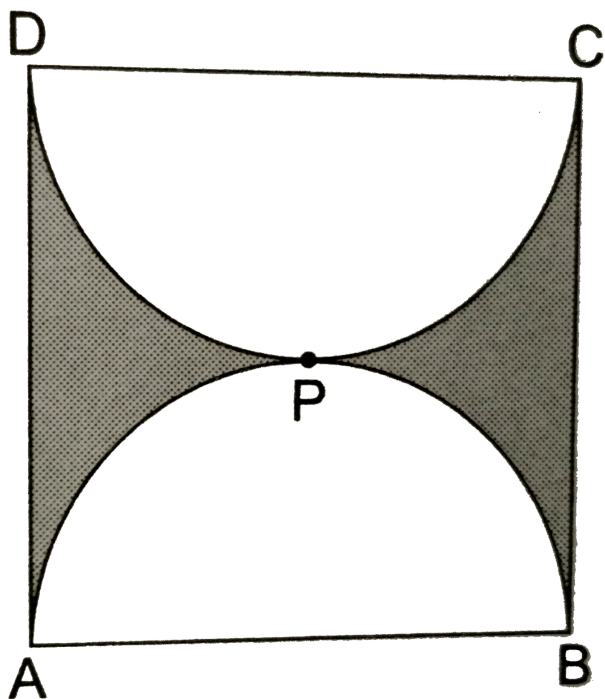
$$\frac{11}{7} \frac{\sin 70^\circ}{\cos 20^\circ} - \frac{4}{7} \frac{\cos 53^\circ \operatorname{cosec} 37^\circ}{\tan 15^\circ \tan 35^\circ \tan 55^\circ \tan 75^\circ}$$

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5. If $3 \cot \theta = 4$, find the value of $\frac{5 \sin \theta - 3 \cos \theta}{5 \sin \theta + 3 \cos \theta}$.

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6. Find the perimeter of the shaded region in the figure, if ABCD is a square of side 14 cm and APB and CPD are semicircles.



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Section C

1. Find the zeroes of the quadratic polynomial $x^2 + 5x + 6$ and verify the relationship between the zeroes and the coefficients.

A. $-3, 3$

B. $-3, 2$

C. $-3, -3$

D. $-3, -2$

Answer: D



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2. Represent the following system of linear equations graphically. From the graph, find the points where the lines intersect x-axis.

$$2x - y = 2, \quad 4x - y = 8$$



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3. In an A.P., the sum of first n terms is $\frac{3n^2}{2} + \frac{13}{2}n$. Find its 25th term.



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4. The line joining the points (2, -1) and (5, -6) is bisected at P. If P lies on the line $2x + 4y + k = 0$, find the value of k.

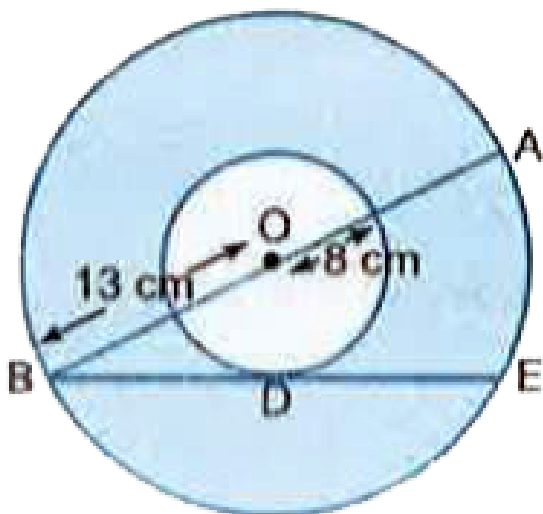
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5. If the distances of P(x, y) from the points A(3, 6) and B(-3, 4) are equal, prove that $3x + y = 5$.

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6. In Fig., the radii of two concentric circles are 13 cm and 8 cm. AB is diameter of the bigger circle. BD is the tangent to the smaller circle

touching it at D. Find the length of AD.



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7. In a single throw of a pair of different dice, what is the probability of getting

(i) a prime number on each dice

(ii) a total of 9 or 11?

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8. A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onwards but less than 60 years.

Age (in years)	Number of policy holders	Age (in years)	Number of poli
Below 20	2	Below 45	89
Below 25	6	Below 50	92
Below 30	24	Below 55	98
Below 35	45	Below 60	100
Below 40	78		



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9. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.



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10. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

Use the above theorem, in the following.

If ABC is an equilateral triangle with $AD \perp BC$, then prove that $AD^2 = 3DC^2$.

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11. A statue 1.46 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60° and from the same point the angle of elevation of the top of the pedestal is 45° . Find the height of the pedestal (use $\sqrt{3} = 1.73$).

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12. If $\tan A = n \tan B$ and $\sin A = m \sin B$, prove that $\cos^2 A = \frac{m^2 - 1}{n^2 - 1}$

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13. Four equal circles are described about the four corners of a square so that each touches two of the others. The shaded area enclosed between the circles $\frac{24}{7} \text{ cm}^2$, find the radius of the circle.



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14. Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively offered to the state government to provide place and the canvas for 1500 tents to be fixed by the government and decided to share the whole expenditure equally. The lower part of each tent is cylindrical of base radius 2.8 m and height 3.5 m, with conical upper part of same base radius but of height 2.1 m. If the canvas used to make the tents costs Rs. 120 per sq. m, find the amount shared by each school to set up the tents. What value is generated by the above problem ? (Use $\pi = \frac{22}{7}$)



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15. Find the mean, mode and median for the following data :

Class	Frequency
0 – 10	8
10 – 20	16
20 – 30	36
30 – 40	34
40 – 50	6
Total	100



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