



MATHS

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MATHS (HINGLISH)

MODEL QUESTION PAPER-6

Section A

1. Apply Euclid's division lemma with number 124 and 24.

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2. Graph of polynomial $P(x)$ is given below. Find the number of zeros of $P(x)$

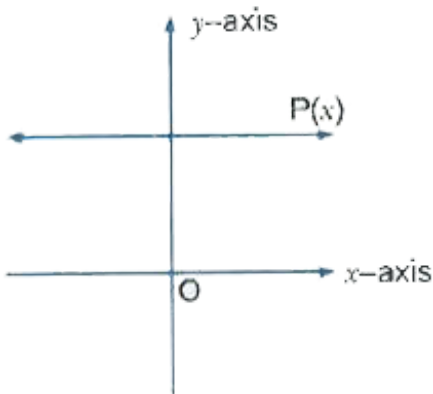


Fig. 1

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3. Form the pair of linear equations in the following problem, and find the solution graphically: 10 students of class X took part in Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.



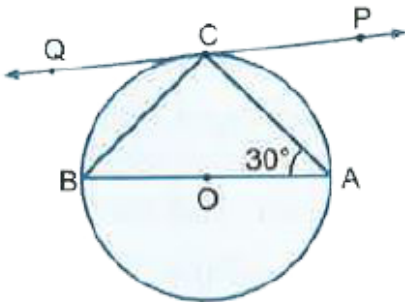
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4. For the AP : $\frac{3}{2}, \frac{1}{2}, -\frac{1}{2}, -\frac{3}{2}, \dots$; write the first term a and the common difference d .



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5. In 2, PQ is a tangent at a point C to circle with centre O . If AB is a diameter and $\angle CAB = 30^\circ$ then find $\angle PCA$.



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6. The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs in the lot is



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Section B

1. If d is the HCF of 45 and 27. Find x, y satisfying $d = 27x + 45y$.



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2. On dividing $(x^3 - 3x^2 + x + 2)$ by a polynomial $g(x)$, the quotient and remainder are $(x - 2)$ and $(-2x + 4)$ respectively. Find $g(x)$.



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3. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then find the value of k .



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4. In a right triangle ABC right-angled at B. if $\tan A = 1$, then verify that $2s \in A \cos A = 1$.



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5. $2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$



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Section C

1. Prove that $\frac{1}{\sqrt{2}}$ is an irrational number.



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2. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.



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3. If the n th terms of the two AP's 9, 7, 5, ... and 24, 21, 18, ... are the same, then find the value of n . Also, that term.



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4. Find the ratio in which the point $P\left(\frac{3}{4}, \frac{5}{12}\right)$ divides the line segment joining the points $A\left(\frac{1}{2}, \frac{3}{2}\right)$ and $B(2, -5)$.



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5. Find the point on the y-axis which is equidistant from the points A(6, 5) and B(-4, 3).



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6. BL and CM are medians of a triangle ABC right angled at A. Prove that

$$4(BL^2 + CM^2) = 5BC^2$$



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7. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T . Find the length TP .



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8. The mean of the following frequency table is 53. But the frequencies f_1 and f_2 in the classes 20-40 and 60-80 are missing. Find the missing frequencies.

Age (in years)	0-20	20-40	40-60	60-80	80-100	Total
Number of people	15	f_1	21	f_2	17	100



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9. All kings, queens and aces are removed from a pack of 52 cards. The remaining cards are well shuffled and then a card is drawn from it. Find the probability that the drawn card is
- (i) a black card (ii) a heart card.



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10. Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its

zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.



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Section D

1. An army from the top of a 75 m high light house from the sea level, observes some suspicious activities of two ships which are sailing towards it and immediately reports it to the navy chief. The angle of depression of two ships are 45° and 30° respectively.

(i) Find the distance between the two ships.

(ii) What value of the army is shown here ?



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2. Rs 6500 were divided equally among a certain number of persons. Had there been 15 more persons, each would have got Rs 30 less. Find the original number of persons.



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3. O is any point inside a rectangle ABCD. Prove that $OB^2 + OD^2 = OA^2 + OC^2$.



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4. Prove that :

$$\frac{\sin A + \cos A}{\sin A - \cos A} + \frac{\sin A - \cos A}{\sin A + \cos A} = \frac{2}{\sin^2 - \cos^2 A}$$



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5. If three circles of radius a each are drawn such that each touches the other two, prove that the area included between them is equal to $\frac{4}{25}a^2$.

[Take $\sqrt{3} = 1.73$ and $\pi = 3.14$]



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6. The height of a cone is 30 cm .A small cone is cut off at the top by a plane parallel to the base . If its volume be $\frac{1}{27}$ of the volume of the given

cone, at what height above the base the section has been made?



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7. The following table gives the height of 42 trees in meters:

Height (in meters)	0-8	8-16	16-24	24-32	32-40	40-48
Number of trees	3	7	13	9	8	2

Change the above distribution to less than type distribution and draw its ogive. Hence obtain the median value.



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