



MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

SUPER MODEL QUESTION PAPER-1

Part A

1. Given that the number of subsets of a set A is 8. Find the number of elements in A.



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2. If $\tan x = \frac{3}{4}$ and x lies in the third quadrant, find $\cos x$



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3. Find 'n' if ${}^n C_7 = {}^n C_6$.



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4. Solve $7x + 3 < 5x + 9, x \in N$



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5. The arithmetic mean of 4 and another number is 10.

Find the other number.

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6. Find the distance between

$$3x + 4y + 5 = 0 \text{ and } 6x + 8y + 2 = 0$$

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7. Given $f(x) = \begin{cases} \frac{x}{|x|} \\ 2 \\ x \neq 0 \\ x = 0 \end{cases}$ find $\lim_{x \rightarrow 0} f(x)$

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8. write the negation of 'For all $a, b \in I, a - b \in I$ '.

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9. The coefficient of variation for a distribution is 60 and standard deviation is 21. Find the arithmetic mean.

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10. Which plane $(4,2,0)$ lies in?

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1. If A and B are two disjoint sets and $n(A) = 15$ and $n(B) = 10$ find $n(A \cup B)$, $N(A \cap B)$.



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2. $f: Z \rightarrow Z$ is a linear function defined by $f = \{(1, 1), (0, -1), (2, 3)\}$, find $f(x)$



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3. The minute hand of a clock is 2.1cm long. How far does its tip move in 20 minutes. $\left(\text{use } \pi = \frac{22}{7}\right)$



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4. Solve $2 \cos^2 x + 3 \sin x = 0$



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5. Prove that $\frac{\sin x + \sin 3x}{\cos x + \cos 3x} = \tan 2x$



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6. If the sum of a certain number of terms of the A.P.
25,22,19.....is 116 then find the number of terms.



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7. Write the inverse , converse of 'If a parallelogram is a square , then it is a rhombus.



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8. Find the terms independent of x in the expansion of

$$\left(x^2 + \frac{1}{x}\right)^9$$



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9. Let $z_1 = 2 - i$, $z_2 = -2 + i$. Find the imaginary part

of $\frac{1}{z_1 \overline{z_2}}$



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10. Obtain all pairs of consecutive odd natural numbers such that in each pair both are more than 50 and their sum is less than 120.



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11. A line cuts off equal intercepts on the coordinate axes. Find the angle made by the line with the positive x - axis.



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12. Show that the points $A(5, -1, 1)$, $B(7, -4, 7)$, $C(1, -6, 10)$, $D(-1, -3, 4)$ form a rhombus.

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13. The centroid of a triangle ABC is $(1, 2, 2)$ if the coordinates of A and B are $(3, -5, 7)$ and $(-1, 7, -6)$ respectively. Find the coordinates of C.

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1. Out of a group of 200 students (who know at least one language), 100 students know English, 80 students know Kannada, 70 students know Hindi. If 40 students know all the three languages. Find the number of students who know exactly two languages.

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2. Let $R: Z \rightarrow Z$ be a relation defined by $R = \{(a, b) : a, b, \in Z, a - b \in z\}$. Show that

(i) $\forall a \in Z, (a, a) \in R$

(ii) $(a, b) \in R \Rightarrow (b, a) \in R$

(iii) $(a, b) \in R \Rightarrow (b, c) \in R \Rightarrow (a, c) \in R$

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3. Show that $\sqrt{3} \operatorname{cosec} 20^\circ - \sec 20^\circ = 4$

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4. Prove that

$$(\cos x + \cos y)^2 + (\sin x - \sin y)^2 = 4 \cos^2 \left(\frac{x + y}{2} \right)$$

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5. Convert the complex number $z = \frac{i - 1}{\frac{\cos \pi}{3} + i \frac{\sin \pi}{3}}$ in the polar form.

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6. Solve graphically $x + y \leq 9$, $y \geq x$, $x \geq 0$

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7. If $x + iy = \frac{2 + i}{2 - i}$ then prove that $x^2 + y^2 = 1$

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8. Find the image of (2,3) on the line $3x+5y=4$.

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9. Reduce the equation $\sqrt{3}x + y - 8 = 0$ to normal form and find the length of the Perpendicular to the normal from origin and angle made by it with positive x axis.



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10. An amount Rs 500/- is deposited in a bank. If the bank pays an interest at the of 10% compound annually, how much will be the amount in 10years?



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11. A parabola with vertex at origin has its focus at the center of $x^2 + y^2 - 10x + 9 = 0$ Find its directrix and latus rectum.

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12. If $f(x) = \frac{x^2 - 4}{x\sqrt{x} - 2\sqrt{2}}$, find $\lim_{x \rightarrow 2} f(x)$ and see whether it equals $f(2)$.

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13. Verify by the method of contradiction that $\sqrt{2}$ is irrational .

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Point D

1. Two students Anil and Sunil appear in an examination. The probability that Anil will qualify in the examination is 0.05 and that Sunil Will qualify is 0.10. The probability that both will qualify in the examination is 0.02 find the probability that Anil and Sunil Will not qualify in the examination.



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2. Prove that $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$, (θ being in radians) and hence show that $\lim_{\theta \rightarrow 0} \frac{\tan \theta}{\theta} = 1$?

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3. $1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$

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4. A group consists of 7 boys and 5 girls. Find the number of ways in which a team of 5 members can be selected so as to have at least one boy and girl.

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5. Prove that the Binomial theorem

$$(a + b)^n = {}^nC_0a^n + {}^nC_1a^{n-1}b + {}^nC_2a^{n-2}b^2 + \dots + {}^nC_nb^n$$

for any positive integer 'n'.



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6. Derive the equation of the ellipse in the form

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1.$$



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7. Find the mean deviation about the mean for the following data.

Marks obtained	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Number of students	2	3	8	14	8	3	2

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8. Derive a formula for the angle between two lines with slopes m_1 and m_2 . Hence the slopes of the lines which make an angle $\frac{\pi}{4}$ with the line $x - 2y + 5 = 0$

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9. Find the sum to n terms of the series $1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \dots$

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Point E

1. Show that $\cos 2A = \cos^2 A - \sin^2 A$

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2. If

$$f(x) \begin{cases} a + bx & x < 1 \\ 4 & x = 1 \\ b - ax & x > 1 \end{cases} \text{ and if } \lim_{x \rightarrow 1} f(x) = f(1),$$

what are the possible value of 'a and b'?

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3. Define hyperbola as a set of points derive its equation

in the form $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$



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4. Find the derivative of $\frac{x + \cos x}{\sin x}$ using rules of differentiation.



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