



MATHS

BOOKS - BHARATI BHAWAN MATHS (HINGLISH)

Main Tests

Exercise

1. Let z, w be complex numbers such that $\bar{z} + i\bar{w} = 0$ and $\arg zw = \pi$ Then $\arg z$ equals



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2. A function $y = f(x)$ has a second order derivative $f''(x) = 6(x - 1)$. If its graph passes through the point $(2, 1)$ and at that point the tangent to the graph is $y = 3x - 5$ then the function is



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3. $\vec{a}, \vec{b}, \vec{c}, \vec{d}$ are four distinct vectors satisfying the conditions

$$\vec{a} \times \vec{b} = \vec{c} \times \vec{d} \text{ and } \vec{a} \times \vec{c} = \vec{b} \times \vec{d},$$

then prove that

$$\vec{a} \cdot \vec{b} + \vec{c} \cdot \vec{d} \neq \vec{a} \cdot \vec{c} + \vec{b} \cdot \vec{d}.$$



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4. A and B are two independent events. C is event in which exactly one of A or B occurs.

Prove that $P(C) \geq P(A \cup B)P(A \cap B)$.





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5. If the normal at an end of a latus rectum of an ellipse passes through an extremity of the minor axis then the eccentricity of the ellipse satisfies .



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6. If a, b, c , are positive real numbers, then prove that (2004, 4M)

$$\{(1 + a)(1 + b)(1 + c)\}^7 > 7^7 a^4 b^4 c^4$$



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7. Let $f(x) = ax^2 + bx + c = 0$ has an irrational root r . If $u = \frac{p}{q}$ be any rational number where a, b, c, p and q are integer. prove that $\frac{1}{q^2} \leq |f(u)|$



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8. A curve passes through $(2, 0)$ and the slope of tangents at point $P(x, y)$ equals

$$\frac{(x + 1)^2 + y - 3}{(x + 1)}.$$

Find the equation of the curve and area enclosed by the curve and the X-axis in the fourth quadrant.



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