



MATHS

BOOKS - PATHFINDER MATHS (BENGALI ENGLISH)

PRINCIPLE OF MATHEMATICAL INDUCTION AND LINEAR INEQUATIONS

Question Bank

1. Byin "Principle of Mathematical Induction" prove that for all

$n \in \mathbb{N}$

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



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2. Prove that by using the principle of mathematical induction for all $n \in \mathbb{N}$:

$$1.2.3 + 2.3.4 + \dots + n(n+1)(n+2) = \frac{n(n+1)(n+2)(n+3)}{4}$$

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3. Prove that by using the principle of mathematical induction for all $n \in \mathbb{N}$:

$$\frac{1}{1.4} + \frac{1}{4.7} + \frac{1}{7.10} + \dots + \frac{1}{(3n-2)(3n+1)} = \frac{n}{3n+1}$$

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4. Byin "Principle of Mathematical Induction" prove that for all $n \in \mathbb{N}$

$$3^n > 2^n$$

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5. Byin "Principle of Mathematical Induction" prove that for all

$n \in \mathbb{N}$

$3^{2n+2} - 8n - 9$ is divisible 64



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6. Prove that by using the principle of mathematical induction for

all $n \in \mathbb{N}$:

$$1 + 2 + 3 + \dots + n < \frac{1}{8}(2n + 1)^2$$



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7. Linear inequation Slove for x:

$$\frac{(x - 2)(x + 3)}{(1 - x)} \geq 0$$

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8. Solve for x:

$$\frac{(x - 1)^2(x - 2)^3(x + 1)^6}{x^8(2x + 3)^3} \leq 0$$

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9. Solve for x :

$$|x - 1| + |x - 2| + (x - 3) \geq 6$$

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10. Solve: $\frac{|x + 3| + x}{x + 2} > 1, x \in R,$

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11. Solve for x :

$$\left| x + \frac{1}{3} \right| > \frac{8}{3}$$



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12. Solve for x :

$$|x - 1| + |x - 2| + (x - 3) \geq 6$$



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13. Solve for x :

$$\frac{x}{x - 5} > \frac{1}{2}$$



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14. Solve the system of inequations $\frac{x}{2x + 1} \geq \frac{1}{4}$, $\frac{6x}{4x - 1} < \frac{1}{2}$



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