



MATHS

BOOKS - KALYANI MATHS (ASSAMESE ENGLISH)

Real Numbers

Example

1. Every integer can be expressed in the form
of $3p$ or $(3p \pm 1)$



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2. Square of n integers can be expressed in the form of $4p$ or $(4p+1)$.



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3. Show that any positive odd integer is of the form $6q+1$, or $6q+3$, or $6q+5$, where q is some integer.



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4. Prove that the product of two consecutive positive integers is divisible by 2.



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5. If a and b are two odd positive integers such that $a > b$. Then prove that one of the two numbers $\frac{a + b}{2}$ and $\frac{a - b}{2}$ is odd and other is even.



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Exercise

1. Applying division algorithm prove that every integer can be expressed in the following form

$$(q \in \mathbb{Z}, q > 0)$$

$$4q, (4q \pm 1) \text{ or } (4q \pm 2)$$



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2. Applying division algorithm prove that every integer can be expressed in the following form

$$(q \in \mathbb{Z}, q > 0)$$

$$5q, (5q \pm 1) \text{ or } (5q \pm 2)$$



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3. Prove that every odd integer can be expressed in the form of $(q \in \mathbb{Z})$

$$4q \pm 1$$



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4. Prove that every odd integer can be expressed in the form of ($q \in \mathbb{Z}$)

$$4q \pm 1$$



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5. If q is a positive integer, square of every integer can be expressed in the form of $8q+1$.



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6. Prove that an integer which can be expressed in the form of $6k+5$ can be also expressed in the form of $3k-1$.



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7. Show that cube of any positive integer is either of the form $4q$, $4q+1$, $4q+3$ for $(q \in \mathbb{Z})$



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8. Show that any positive even integer is of the form $6q$, $6q+2$, $6q+4$.



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9. If $(n \in \mathbb{N})$ then applying division algorithm prove that each of the following is an integer

$$\frac{n(3n + 1)}{2}$$



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10. If $(n \in \mathbb{N})$ then applying division algorithm prove that each of the following is an integer

$$\frac{n(4n^2 - 1)}{3}$$



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11. If $(n \in \mathbb{N})$ then applying division algorithm prove that each of the following is an integer

$$\frac{n^3 - n}{3}$$



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12. If $(n \in \mathbb{N})$ then applying division algorithm prove that each of the following is an integer

$$\frac{n^3 + 3n^2 + 2n}{6}$$



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