# Step Academy official
**Model Town Grw PH: 03016652757**

| CLASS: 9th [New Books] | Mathematics | TOTAL MARKS: 40 |
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| STUDENT NAME: ..................... | PAPER CODE: 67901 | TIME: 90 |

Paper Date: 2026-02-04

(UNIT 1: Real Number) (UNIT 2: Logarithms) (UNIT 3: Set and Functions) (UNIT 4: Factorization and Algebraic Manipulation) (UNIT 5: Linear Equations and Inequalities) (UNIT 6: Trigonometry)

**Q1.** Choose the correct answer. 10X1=10

**1.** $2^x \times 8^x = 64$ then x=

(A) 3/2 (B) 3/4 (C) 5/6 (D) 2/3

**2.** $\pi$ and e are:

(A) Natural number (B) ntegers (C) Rational numbers (D) Irrational numbers

**3.** $2^x \times 8^x = 64$ then x=

(A) $\frac{3}{2}$ (B) $\frac{3}{4}$ (C) $\frac{5}{6}$ (D) $\frac{2}{3}$

**4.**
Let $A = \{1,2,3\}$ and $B = \{a,b\}$ two non-empty sets and $f : A \to B$ be a function defined as $f = \{(1,a),(2,b),(3,b)\}$, then which of the following statement is true?

(A) f is injective (B) f is surjective (C) f is bijective (D) f is into only

**5.** If $A \subseteq B$ and $B - A \neq \phi$, then $n(B - A)$ is equal to:

(A) 0 (B) n(B) (C) n(A) (D) n(B)-n(A)

**6.** The LCM of $16x^2$, 4x and 30xy is

(A) $480x^3y$ (B) 240xy (C) $240x^2y$ (D) $120x^4y$

**7.** The HCF of $a^3b^3$ and $ab^2$ is:

(A) $a^3b^3$ (B) $ab^2$ (C) $a^4b^5$ (D) $a^2b$

**8.** The linear equation formed out of the linear inequality is called:

(A) Linear equation (B) Associated equation (C) Quadratic equal (D) None of these

**9.** Which of the following is a valid identity:

**(A)** $\cos\left(\dfrac{\pi}{2}-\theta\right)=\sin\theta$    **(B)** $\cos\left(\dfrac{\pi}{2}-\theta\right)=\cos\theta$    **(C)** $\cos\left(\dfrac{\pi}{2}-\theta\right)=\sec\theta$    **(D)** $\cos\left(\dfrac{\pi}{2}-\theta\right)=\csc\theta$

**10.** $\sqrt{3}+\sqrt{5}$ is:

**(A)** Whole number      **(B)** Integer      **(C)** Rational number      **(D)** Irrational numbe

**Q2.**    **Write short answers of the following questions.**        **10X2=20**

**1.** Express the following in exponential form: $\log_2 16 = 4$

**2.** Find the value of x in the following: $\log_5 1 = x$

**3.** Find characteristic of the following number: 5287

**4.** Find logarithm of the following number: 0.000354

**5.** Define reference position.

**6.** Expand the following using laws of logarithms: $\log_3 \sqrt[6]{m^5 n^3}$

**7.** What is the number of element of the power set of each of the following set? $\{\,\}$

**8.** How we represent a set and its elements.

**9.** Factorize the following: $4x^3 + 18x^2 - 12x$

**10.** If $\theta$ lies in first quadrant, find the remaining trigonometric ratios of $\theta$: $\cot\theta = \sqrt{\dfrac{3}{2}}$

**Q3.**    **Write detailed answers of the following questions.**        **2X5=10**

**1.** Show that: $\dfrac{1}{\csc\theta - \cot\theta} - \dfrac{1}{\sin\theta} = \dfrac{1}{\sin\theta} - \dfrac{1}{\csc\theta + \cot\theta}$

**2.**
Verify the properties for the sets, A,B and C given below: (i) Associativity of Union (ii) Associativity of intersection (iii) Distributivity of Union over intersection. (iv) Distributivity of intersection over union.
$A = \{1,2,3,4\}$, $B = \{3,4,5,6,7,8\}$, $C = \{5,6,7,9,10\}$