# MAHARASHTRA BOARD CLASS 9
## MATHS PART 1 QUESTIONS

**Time: 2 hours**                                                                                      **Total Marks: 60**

**Note: (1) All questions are compulsory.**

   **(2) Use of a calculator is not allowed.**

**Q1 A. Choose the correct alternative for the following questions.**                          **5**

1.  If given two sets P & Q, then the set which consists of the elements which are common in both P and Q is called
    A.  Union of P & Q
    B.  Complement of P
    C.  Complement of Q
    D.  Intersection of P & Q

2.  Find a rational number in between $\sqrt{5}$ and $\sqrt{6}$.
    A.  $\frac{\sqrt{5}+\sqrt{6}}{2}$
    B.  $\frac{\sqrt{5}.\sqrt{6}}{2}$
    C.  2.3
    D.  1.32

3.  Find the value of z if z : 6 = 25 : 3
    A.  150
    B.  25
    C.  50
    D.  75

4.  The degree of the polynomial $p^{12} + 15p^{9} - 75$ is
    A.  9
    B.  12
    C.  13
    D.  21

5.  Which of the ordered pair (y, z) is a solution of the following equation:

    $$4y - 1 = 3z + 4$$
    A.  (1,2)
    B.  (2,1)
    C.  (3,2)
    D.  (2,3)

**B. Solve all the following**                                                                        **6**

1.  Determine X ∩ Y and X ∪ Y when X is the set of all prime numbers less than 25 and Y is the set of all composite natural numbers greater than 5 and less than 20.

2. If $p = 3 + \sqrt{5}$, find the value for $\left(p - \frac{1}{p}\right)$.

3. Suppose Y = {8, 9, 10, 11, 12, 13}, Z = {4, 5, 6, 7, 8, 9, 10, 11}, find Y' in Z and draw Venn diagram.

4. Factorize: $y^3 - 2y^2z + 5yz^2 - 10z^3$

5. Show that p = 5 and q = 10 satisfy the linear equation : 3p – 2q + 5 = 0

6. If the median of a series of data is 17 and mean is 25, then find the mode.

**Q.2 : Solve the following questions.** **12**

1. Give the definition for set. Write the following sets in set builder form.
   a) {1, 8, 27, 64, 125, 216}
   b) {8, 16, 24, 32, 40, 48, 56}

2. Kashmeera sold her watch at 18% loss. If she has sold for Rs 100 more, her profit would be 7%. Find the cost price of the watch.

3. If $y = \frac{3 + \sqrt{7}}{3 - \sqrt{7}}$ and $z = \frac{3 - \sqrt{7}}{3 + \sqrt{7}}$ find the value of $y^2 + z^2 + yz$.

4. Brenda took a total of 24 classes over the course of 6 weeks in a workshop. After attending 7 weeks of workshop, how many classes will Brenda have taken in total? Assuming the relationship is directly proportional.

5. Write four solutions for the linear equation: a + 2y = 15

6. Number of fruits sold by a fruit seller in 9 days are as follows: 40, 55, 34, 56, 49, 75, 63, 48, 57.  Find the mean and median for the data.

**Q.3: Solve any 5 of the following questions:** **15**

1. Rationalize the denominator and simplify $\frac{5\sqrt{3} + 7\sqrt{2}}{\sqrt{48} - \sqrt{18}}$

2. Calculate the value of p, q and r where
   p + q = 24;
   q + r = 18;
   r + p = 22;

3. Raju finishes one book in 10 days. Using the following table, determine the days he will take to finish the books.

| Number of books | 1 | 3 | 8 | 13 |
|---|---|---|---|---|
| Number of days | 10 | ... | ... | ... |

4. If $z = (1 + \sqrt{3} + \sqrt{5})$ then find $6z^2 - 15z + 24$

5. The following table shows the number of students studying in different sections.

| Number of students | 50 | 75 | 55 | 45 | 70 |
|---|---|---|---|---|---|
| Sections | A | B | C | D | E |

Draw a bar graph to represent above data.

6. Below are the marks obtained by 25 students in Social Science out of 100.

82, 75, 94, 73, 86, 92, 65, 83, 79, 96, 66, 68, 57, 76, 95, 84, 59, 85, 76, 63, 83, 89, 92, 71, 65
Prepare a frequency distribution table for the above data.

**Q.4  Solve any three of the following questions:** 12
1. Suppose P is a set where P = {1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25} and U, V and W are subsets of P where U = {9, 21, 11, 17, 15}, V = {1, 5, 9, 11} and W = {5, 13, 19, 23, 25}. Write down the following sets:
   (i)  U' ∩ V
   (ii) V ∪ W
   (iii)    W' ∩ V'
   (iv)    U' ∪ W
2. Determine the value of p from the following ratio:
   $(p+5) : (p+15) = (p-1) : (p+6)$
3. The cost of a dining table and an oven are in the ratio of 7:5. If the dining table costs 9000 more than the oven, then what is the price of the oven?
4. If the denominator of a fraction is decreased by 3, then we get 2. Write the linear equation to represent this formation and draw the graph for the linear equation as well.

**Q.5 Solve any two of the following:** 10
1. The sum of two numbers is 13. 8 times of one number is equal to 5 times the other.
   Find both the numbers.

2. Calculate the time if the simple interest on Rs.4000 at the rate of 10.5% per annum for the duration of 4 years is same as the simple interest on Rs.3500 at 9% per annum.

3.  Sixteen years ago, a mother was 3 times as old as her son. Now the mother is only twice as old as her son. Find the sum of present ages of mother and son.