QUESTION BANK

CLASS : IX   **SUBJECT**: MATHEMATICS   **TOPIC** : NUMBER SYSTEM

MULTIPLE CHOICE QUESTION

1. The rational number $\frac{3}{40}$ is equal to

   (a) 0.75 (b) 0.12   (c) 0.012   (d) 0.075

2. A rational number between 3 and 4 is
   a) $\frac{3}{2}$ b) $\frac{4}{3}$ c) $\frac{7}{2}$ d) $\frac{7}{4}$

3. Which one of the following is an irrational number
   a) $\sqrt{4}$ b) $3\sqrt{8}$ c) $\sqrt{100}$ d) $-\sqrt{0.64}$

4. **T**he value of $(3 + \sqrt{3})(3 - \sqrt{3})$
   (a) 0   (b) 6   (c) 9   (d) 3

5. The value of $(\sqrt{5} + \sqrt{2})^2$
   a. $7+2\sqrt{5}$ b. $1+5\sqrt{2}$ c. $7 + 2\sqrt{10}$ d. $7 - 2\sqrt{10}$

6. The value of $(\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2})$
   (a) 10 (b) 7   (c) 3   (d) $\sqrt{3}$

7. The value of $(3+\sqrt{3})(2 +\sqrt{2})$ …………………………

8. On rationalizing the denominator of $\frac{1}{\sqrt{7}-\sqrt{6}}$ we get,

   a. $\frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}-\sqrt{6}}$ b. $\frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}+\sqrt{6}}$ c. $\sqrt{7} + \sqrt{6}$ d. $\sqrt{7} - \sqrt{6}$

9. Which of the following is true?
   a. Every whole number is a natural number
   b. (b) Every integer is a rational number
   c. Every rational number is an integer
   d . Every integer is a whole number

10. For Positive real numbers a and b, which is not true?
    a. $\sqrt{ab} = \sqrt{a}\,\sqrt{b}$ b. $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$ c. $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) = a + b$
    b.   d. $(a +\sqrt{b})(a - \sqrt{b}) = a^2$ - b

11. The value of n for which $\sqrt{n}$ be a rational number is

    (a) 2   (b) 4   (c) 3   (d) 5

12. $\frac{3\sqrt{12}}{6\sqrt{27}}$ equals
    a. $\frac{1}{2}$ b. $\sqrt{2}$ c. $\sqrt{3}$ d. $\frac{1}{3}$

13. Every rational number is
    a. Whole number   b. Natural number   c. Integer   d. Real number

14. $3\sqrt{6} + 4\sqrt{6}$ is equal to:

   a. $6\sqrt{6}$ b. $7\sqrt{6}$ c. $4\sqrt{12}$ d. $7\sqrt{12}$

15. $\sqrt{6} \times \sqrt{27}$ is equal to:

   a. $9\sqrt{2}$ b. $3\sqrt{3}$ c. $2\sqrt{2}$ d. $9\sqrt{3}$

16. Which of the following is equal to x^3?

   a. $x^6 - x^3$ b. $x^6 . x^3$ c. x^6/x^3 d. $(x^6)^3$

17. Which of the following is an irrational number?

   a. $\sqrt{23}$ b. $\sqrt{225}$ c. 0.3796   d. 7.478478

18. The value of $\sqrt{10}$ times $\sqrt{15}$ is equal to

   a. $5\sqrt{6}$ b. $\sqrt{25}$ c. $10\sqrt{5}$ d. $\sqrt{5}$

19. The value of $125^{-\frac{1}{3}}$ is :

   a. $\frac{1}{5}$ b. $\frac{1}{25}$ c. 5   d. 15

20.   0.6666…. in $\frac{p}{q}$ form is

   a. $\frac{2}{3}$ b. $\frac{6}{99}$ c. $\frac{3}{5}$ d. $\frac{1}{66}$

SUBJECTIVE QUESTIONS

21. Locate $\sqrt{3}$ on the number line.

22. Represent $\sqrt{(9.3)}$ on the number line.

23. What is the value of $(256)^{0.16} \times (256)^{0.09}$?

24. Evaluate: $(\sqrt{5} + \sqrt{2})^2 + (\sqrt{8} - \sqrt{5})^2$

25. Find the square root of $10 + \sqrt{24} + \sqrt{60} + \sqrt{40}$

26. If $x = 9 + 4\sqrt{5}$, find the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$.

27. Find 'x', if $2^{x-7} \times 5^{x-4} = 1250$.

28. Simplify:

$$\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} + \frac{2\sqrt{3}}{\sqrt{6}+2}.$$

29. Prove that:

$$\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \dots + \frac{1}{\sqrt{8}+3} = 2.$$

30. Find a and b, if

$$\frac{2\sqrt{5}+\sqrt{3}}{2\sqrt{5}-\sqrt{3}} + \frac{2\sqrt{5}-\sqrt{3}}{2\sqrt{5}+\sqrt{3}} = a + \sqrt{15}b$$

31. If $x^a = y$, $y^b = z$ and $z^c = x$, then prove that abc = 1

32. Prove that:

$$\frac{x^{-1}}{x^{-1}+y^{-1}} + \frac{x^{-1}}{x^{-1}-y^{-1}} = \frac{2y^2}{y^2-x^2}.$$

33. If $x = \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $x^2 + y^2 + xy$.

34. If $x = \dfrac{2-\sqrt{5}}{2+\sqrt{5}}$ and $y = \dfrac{2+\sqrt{5}}{2-\sqrt{5}}$, find the value of $x^2 - y^2$.

35. If $x = (2+\sqrt{3})$, find the value of $x^2 + \dfrac{1}{x^2}$.

36. Find six rational numbers between 3 and 4.

37. What is the value of $5^0 + 2^2 + 4^0 + 7^1 - 3^1$?

38. Prove that

(i) $\left(\dfrac{x^a}{x^b}\right)^{a^2+ab+b^2} \times \left(\dfrac{x^b}{x^c}\right)^{b^2+bc+c^2} \times \left(\dfrac{x^c}{x^a}\right)^{c^2+ca+a^2} = 1$

(ii) $\left(\dfrac{x^a}{x^{-b}}\right)^{a^2-ab+b^2} \times \left(\dfrac{x^b}{x^{-c}}\right)^{b^2-bc+c^2} \times \left(\dfrac{x^c}{x^{-a}}\right)^{c^2-ca+a^2} = 1$

(iii) $\left(\dfrac{x^a}{x^b}\right)^c \times \left(\dfrac{x^b}{x^c}\right)^a \times \left(\dfrac{x^c}{x^a}\right)^b = 1$

39.

40. Prove that

$$(i)\ \frac{1}{1+x^{a-b}}+\frac{1}{1+x^{b-a}}=1$$

$$(ii)\ \frac{1}{1+x^{b-a}+x^{c-a}}+\frac{1}{1+x^{a-b}+x^{c-b}}+\frac{1}{1+x^{b-c}+x^{a-c}}$$

41. Give an example of each, of two irrational numbers whose:
   (i) difference is a rational number.
   (ii) difference is an irrational number.
   (iii) sum is a rational number.
   (iv) sum is an irrational number.
   (v) product is a rational number.
   (vi) product is an irrational number.
   (vii) quotient is a rational number.
   (viii) quotient is an irrational number.

42. Write the value of $\{5(8^{1/3}+27^{1/3})^3\}^{1/4}$

43. Simplify:

i. $\dfrac{\left(2^5\right)^2\times 7^3}{8^3\times 7}$

ii. $\dfrac{25\times 5^2\times t^8}{10^3\times t^4}$

iii. $\dfrac{3^5\times 10^5\times 25}{5^7\times 6^5}$

44. If $x=\dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find i. $x^2+\dfrac{1}{x^2}$

45. If $x=2+\sqrt{3}$, find $x^4+\dfrac{1}{x^4}$.

46. Represent the real number $\sqrt{7}$ on the number line.

47. Simplify $\dfrac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$

48. Simplify by rationalising the denominator: $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$.

49. If $2^a = 3^b = 6^c$ then show that $c = \frac{ab}{a+b}$.

50. If $x = \frac{\sqrt{p+q} + \sqrt{p-q}}{\sqrt{p+q} - \sqrt{p-q}}$, then find the value of $qx^2 - 2px + q$.