

NUMBER SYSTEM

1. The value of $32^{2/5}$ is :
(a) 2 (b) 4 (c) 16 (d) 14
2. The value of $16^{3/4}$ is :
(a) 4 (b) 12 (c) 8 (d) 48
3. The value of $125^{-1/3}$ is :
(a) $\frac{1}{5}$ (b) $\frac{1}{25}$ (c) $\frac{1}{15}$ (d) $\frac{1}{125}$
4. The value of $11^{1/2} \div 11^{1/4}$ is :
(a) $11^{1/4}$ (b) $11^{3/4}$ (c) $11^{1/8}$ (d) $11^{1/2}$
5. The value of $64^{-3/2}$ is :
(a) $\frac{1}{96}$ (b) $\frac{1}{64}$ (c) 512 (d) $\frac{1}{512}$
6. The value of $(125)^{2/3}$ is :
(a) 5 (b) 25 (c) 45 (d) 35
7. The value of $25^{3/2}$ is :
(a) 5 (b) 25 (c) 125 (d) 625
8. The value of $\frac{1}{11}$ in decimal form is:
(a) $0.0\overline{99}$ (b) $0.9\overline{09}$ (c) $0.\overline{09}$ (d) $0.00\overline{9}$
9. Decimal expansion of a rational number is terminating if in its denominator there is:
(a) 2 or 5 (b) 3 or 5 (c) 9 or 11 (d) 3 or 7
10. The exponent form of $\sqrt[3]{7}$ is:
(a) 7^3 (b) 3^7 (c) $7^{1/3}$ (d) $3^{1/7}$

NUMBER SYSTEM

1. Which of the following is true?
(a) Every whole number is a natural number (b) Every integer is a rational number
(c) Every rational number is an integer (d) Every integer is a whole number
2. For Positive real numbers a and b, which is not true?
(a) $\sqrt{ab} = \sqrt{a}\sqrt{b}$ (b) $(a + \sqrt{b})(a - \sqrt{b}) = a^2 - b$
(c) $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$ (d) $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) = a + b$
3. Out of the following, the irrational number is
(a) $1.\overline{5}$ (b) $2.4\overline{77}$ (c) $1.2\overline{77}$ (d) π
4. To rationalize the denominator of $\frac{1}{\sqrt{a+b}}$, we multiply this by
(a) $\frac{1}{\sqrt{a+b}}$ (b) $\frac{1}{\sqrt{a-b}}$ (c) $\frac{\sqrt{a+b}}{\sqrt{a+b}}$ (d) $\frac{\sqrt{a-b}}{\sqrt{a-b}}$
5. The number of rational numbers between $\sqrt{3}$ and $\sqrt{5}$ is
(a) One (b) 3 (c) none (d) infinitely many
6. If we add two irrational numbers, the resulting number
(a) is always an irrational number (b) is always a rational number
(c) may be a rational or an irrational number (d) always an integer
7. The rationalizing factor of $7 - 2\sqrt{3}$ is
(a) $7 - 2\sqrt{3}$ (b) $7 + 2\sqrt{3}$ (c) $5 + 2\sqrt{3}$ (d) $4 + 2\sqrt{3}$
8. If $\frac{1}{7} = 0.\overline{142857}$, then $\frac{4}{7}$ equals
(a) $0.4\overline{28571}$ (b) $0.5\overline{71428}$ (c) $0.8\overline{57142}$ (d) $0.2\overline{85718}$
9. The value of n for which $\sqrt{n}$ be a rational number is
(a) 2 (b) 4 (c) 3 (d) 5
10. $\frac{3\sqrt{12}}{6\sqrt{27}}$ equals
(a) $\frac{1}{2}$ (b) $\sqrt{2}$ (c) $\sqrt{3}$ (d) $\frac{1}{3}$
11. $(3 + \sqrt{3})(3 - \sqrt{2})$ equals
(a) $9 - 5\sqrt{2} - \sqrt{6}$ (b) $9 - \sqrt{6}$ (c) $3 + \sqrt{2}$ (d) $9 - 3\sqrt{2} + 3\sqrt{3} - \sqrt{6}$

13. If $x = \frac{2-\sqrt{5}}{2+\sqrt{5}}$ and $y = \frac{2+\sqrt{5}}{2-\sqrt{5}}$, find the value of $x^2 - y^2$.
14. If $\frac{5+2\sqrt{3}}{7+\sqrt{3}} = a - \sqrt{3}b$, find a and b where a and b are rational numbers.
15. If a and b are rational numbers and $\frac{4+3\sqrt{5}}{4-3\sqrt{5}} = a + b\sqrt{5}$, find the values of a and b.
16. If a and b are rational numbers and $\frac{2+\sqrt{3}}{2-\sqrt{3}} = a + b\sqrt{3}$, find the values of a and b.
17. If a and b are rational numbers and $\frac{\sqrt{11}-\sqrt{7}}{\sqrt{11}+\sqrt{7}} = a - b\sqrt{77}$, find the values of a and b.
18. Evaluate: $\frac{1}{\sqrt{2}+1} + \frac{1}{\sqrt{3}+\sqrt{2}} + \frac{1}{\sqrt{4}+\sqrt{3}} + \dots + \frac{1}{\sqrt{9}+\sqrt{8}}$
19. If $x = \frac{1}{2+\sqrt{3}}$, find the value of $2x^3 - 7x^2 - 2x + 1$.
20. If $x = \frac{1}{2-\sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$.
21. If $\sqrt{2} = 1.414$ and $\sqrt{5} = 2.236$, find the value of $\frac{\sqrt{10}-\sqrt{5}}{2\sqrt{2}}$ upto three places of decimals.
22. Find six rational numbers between 3 and 4.
23. Find five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$.
24. Find the value of a and b in $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$.
25. Find the value of a and b in $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a + b\sqrt{3}$.
26. Find the value of a and b in $\frac{5-\sqrt{6}}{5+\sqrt{6}} = a - b\sqrt{6}$.
27. Simplify $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$ by rationalizing the denominator.
28. Simplify $\frac{\sqrt{5}-1}{\sqrt{5}+1} + \frac{\sqrt{5}+1}{\sqrt{5}-1}$ by rationalizing the denominator.
29. Simplify $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}} + \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ by rationalizing the denominator.
30. If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find (i) $x^2 + \frac{1}{x^2}$ (ii) $x^4 + \frac{1}{x^4}$.
31. If $x = 4 - \sqrt{15}$, find (i) $x^2 + \frac{1}{x^2}$ (ii) $x^4 + \frac{1}{x^4}$.
32. If $x = 2 + \sqrt{3}$, find (i) $x^2 + \frac{1}{x^2}$ (ii) $x^4 + \frac{1}{x^4}$.
33. Represent the real number $\sqrt{10}$ on the number line.
34. Represent the real number $\sqrt{13}$ on the number line.