

1.6 ASSIGNMENT

EXERCISE

OBJECTIVE - 1.3

1. If $x = 3 + \sqrt{8}$ and $y = 3 - \sqrt{8}$ then $\frac{1}{x^2} + \frac{1}{y^2} =$
(A) -34 (B) 34 (C) $12\sqrt{8}$ (D) $-12\sqrt{8}$
2. If $\frac{3+\sqrt{7}}{3-\sqrt{7}} = a + b\sqrt{7}$ then $(a,b) =$
(A) (8, -3) (B) (-8, -3) (C) (-8, 3) (D) (8, 3)
3. $\frac{\sqrt{5}-2}{\sqrt{5}+2} - \frac{\sqrt{5}+2}{\sqrt{5}-2} =$
(A) $8\sqrt{5}$ (B) $-8\sqrt{5}$ (C) $6\sqrt{5}$ (D) $-6\sqrt{5}$
4. If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = 1$, the value of $\frac{x-y}{x-3y}$ is :
(A) $\frac{5}{\sqrt{5}-4}$ (B) $\frac{5}{\sqrt{6}+4}$ (C) $\frac{\sqrt{6}-4}{5}$ (D) $\frac{\sqrt{6}+4}{5}$
5. Which one is greatest in the following :
(A) $\sqrt{2}$ (B) $\sqrt[3]{3}$ (C) $\sqrt[3]{4}$ (D) $\sqrt[3]{2}$
6. The value of $\sqrt[5]{(32)^{-3}}$ is :
(A) $1/8$ (B) $1/16$ (C) $1/32$ (D) None
7. If $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $y = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ the value of $x^2 + xy + y^2$ is :
(A) 99 (B) 100 (C) 1 (D) 0
8. Simplify : $\frac{2}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{2}} - \frac{3}{\sqrt{5}+\sqrt{2}}$
(A) 1 (B) 0 (C) 10 (D) 100

9. Which of the following is smallest ?
 (A) $\sqrt[4]{5}$ (B) $\sqrt[5]{4}$ (C) $\sqrt{4}$ (D) $\sqrt{3}$
10. The product of $\sqrt{3}$ and $\sqrt[3]{5}$ is :
 (A) $\sqrt[6]{375}$ (B) $\sqrt[6]{675}$ (C) $\sqrt[6]{575}$ (D) $\sqrt[6]{475}$
11. The exponential form of $\sqrt{\sqrt{2} \times \sqrt{2} \times \sqrt{2}}$ is :
 (A) $2^{1/16}$ (B) $8^{3/4}$ (C) $2^{3/4}$ (D) $8^{1/2}$
12. The value of x, if $5^{x-3} \cdot 3^{2x-8} = 225$, is :
 (A) 1 (B) 2 (C) 3 (D) 5
13. If $2^{5x} \div 2^x = \sqrt[5]{2^{20}}$ then x =
 (A) 0 (B) -1 (C) $\frac{1}{2}$ (D) 1
14. $\sqrt[3]{(729)^{2.5}} =$
 (A) $\frac{1}{81}$ (B) 81 (C) 243 (D) 729
15. $\sqrt[4]{\sqrt[3]{x^2}} =$
 (A) x (B) $x^{\frac{1}{2}}$ (C) $x^{\frac{1}{3}}$ (D) $x^{\frac{1}{6}}$

SUBJECTIVE - 1.3

1. Arrange the following surds in ascending order of magnitude :
 (i) $4\sqrt{10}, 3\sqrt{6}, \sqrt{3}$ (ii) $3\sqrt{4}, 4\sqrt{5}, \sqrt{3}$
2. Which is greater :
 $\sqrt{17} - \sqrt{12}$ or $\sqrt{11} - \sqrt{6}$.
3. Simplify : $\frac{8}{\sqrt{15+1} - \sqrt{5} - \sqrt{3}}$.
4. If p and q are rational number and $p - \sqrt{q} = \frac{4+\sqrt{2}}{3+\sqrt{2}}$ find p and q.
5. Find the simplest R.F. of :
 (i) $\sqrt[3]{32}$ (ii) $\sqrt[3]{36}$ (iii) $2^{3/5}$

6. Rationalise the denominator :

(i) $\frac{3}{\sqrt{5}}$

(ii) $\frac{\sqrt{2} + \sqrt{5}}{\sqrt{3}}$

7. Rationalise the denominator and simplify :

(i) $\frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$

(ii) $\frac{1 + \sqrt{2}}{3 + 2\sqrt{2}}$

(iii) $\frac{4\sqrt{3} + 5\sqrt{2}}{\sqrt{48} + \sqrt{18}}$

8. Simplify :

(i) $\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}} + \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} + \sqrt{3}}$

(ii) $\frac{7 + 3\sqrt{5}}{3 + \sqrt{5}} - \frac{7 - 3\sqrt{5}}{3 - \sqrt{5}}$

9. Find the value of a and b

(i) $\frac{\sqrt{11} - \sqrt{7}}{\sqrt{11} + \sqrt{7}} = a - b\sqrt{77}$

(ii) $\frac{5 + \sqrt{6}}{5 - \sqrt{6}} = a + b\sqrt{6}$

10. If $x = \frac{\sqrt{3} + 1}{2}$ find the value of $4x^3 + 2x^2 - 8x + 7$.

11. If $x = \frac{5 - \sqrt{21}}{2}$ show that $\left(x^3 + \frac{1}{x^3}\right) - 5\left(x^2 + \frac{1}{x^2}\right) + \left(x + \frac{1}{x}\right) = 0$.

12. Show that $a = x + 1/x$, where $x = \frac{\sqrt{a+2} + \sqrt{a-2}}{\sqrt{a+2} - \sqrt{a-2}}$.

13. Prove that : $\frac{1}{3 - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}} - \frac{1}{\sqrt{6} - \sqrt{5}} + \frac{1}{\sqrt{5} - 2} = 5$.

14. If $x = \frac{\sqrt{5} + \sqrt{2}}{\sqrt{5} - \sqrt{2}}$ and $y = \frac{\sqrt{5} - \sqrt{2}}{\sqrt{5} + \sqrt{2}}$ find the value of $3x^2 + 4xy - 3y^2$.

15. Evaluate:

$$\frac{\sqrt{\sqrt{5} + 2} + \sqrt{\sqrt{5} - 2}}{\sqrt{\sqrt{5} + 1}} - \sqrt{3 - 2\sqrt{2}}.$$

16. If $x = 3$, $b = 4$ then find the values of :

(i) $a^b + b^a$

(ii) $a^a + b^b$

(iii) $a^b - b^a$

17. Simplify :

$$(\sqrt{x})^{-2/3} \sqrt{y^4} \div \sqrt{xy^{-1/2}}.$$

18. Simplify :

(i) $[16^{-1/5}]^{5/2}$

(ii) $[0.001]^{\frac{1}{3}}$

19. If $\frac{9^n \times 3^2 \times [3^{-n/2}]^2 - (27)^n}{3^{3m} \times 2^3} = \frac{1}{27}$, then prove that $m - n = 1$.

20. Find the value of x , if $5^{x-3(2x-3)} = 625$.

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