

UNIT 4 :

Surds

Level 1

1 $\sqrt{125} - \frac{3}{2}\sqrt{5} =$

A $\frac{5}{2}\sqrt{5}$

B $\frac{7}{2}\sqrt{5}$

C $\frac{9}{2}\sqrt{5}$

D $22\sqrt{5}$

E $\frac{47}{2}\sqrt{5}$

2 Simplify $\sqrt{ab^2c^6} + abc^2$.

A $\sqrt{abc^2}$

D $\sqrt{abc^2}(c^2 + \sqrt{a})$

B $\sqrt{abc^3}$

E $\sqrt{abc^3}(c+a)$

C $\sqrt{abc^2}(c + \sqrt{a})$

3 Arrange $\sqrt{5}$, $\sqrt[3]{9}$, $\sqrt[6]{36}$ in descending order of magnitude.

A $\sqrt{5}$, $\sqrt[3]{9}$, $\sqrt[6]{36}$

D $\sqrt[3]{9}$, $\sqrt[6]{36}$, $\sqrt{5}$

B $\sqrt{5}$, $\sqrt[6]{36}$, $\sqrt[3]{9}$

E $\sqrt[6]{36}$, $\sqrt[3]{9}$, $\sqrt{5}$

C $\sqrt[3]{9}$, $\sqrt{5}$, $\sqrt[6]{36}$

4 Simplify $(\sqrt{a} + \frac{1}{\sqrt{a}})^2$.

A $a + 2\sqrt{a} + 1$

D $a + 1 + \frac{1}{a}$

B $a + 2\sqrt{a} + \frac{1}{a}$

E $a + 2 + \frac{1}{a}$

C $a + \frac{1}{a}$

5 If $x = 1 + \sqrt{2}$, $x^2 - 2x =$

A 0


B 1

C $\sqrt{2}$

D $2\sqrt{2}$

E $1 + \sqrt{2}$

6 $\sqrt{\frac{n+1}{n}} - \sqrt{\frac{n}{n+1}} =$

A $\frac{1}{n(n+1)}$ 


D $\frac{\sqrt{n+1} - \sqrt{n}}{\sqrt{n(n+1)}}$

B $-\frac{1}{\sqrt{n(n+1)}}$

E $\frac{\sqrt{n+1} + \sqrt{n}}{\sqrt{n(n+1)}}$

C $\frac{1}{\sqrt{n(n+1)}}$

7 $\frac{98}{4\sqrt{7}} =$

A $\frac{5\sqrt{7}}{2}$ 


B $6\sqrt{7}$

C $7\sqrt{7}$

D $\frac{7\sqrt{7}}{2}$

E $\frac{7\sqrt{7}}{4}$

[8] Rationalize $\frac{2}{\sqrt{5} + \sqrt{3}}$.

A $\sqrt{5} - \sqrt{3}$ 

D $\sqrt{5} + \sqrt{3}$

B $\frac{\sqrt{5} - \sqrt{3}}{2}$

E $2(\sqrt{5} - \sqrt{3})$


C $\frac{\sqrt{5} + \sqrt{3}}{2}$

Level 2

9 $\frac{1}{5}\sqrt{200} + \frac{\sqrt{2}}{2} - \sqrt{32} + \sqrt{\frac{1}{2}} =$

A 0

B $\sqrt{2}$

 $-2\sqrt{2}$

D $-\frac{3}{2}\sqrt{2}$

E $-\sqrt{2}$

10 If $2^3\sqrt{6} = \sqrt{n}$, $n =$


A $\sqrt{48}$

B $\sqrt[3]{48}$

C $\sqrt[3]{12}$

D $\sqrt[3]{48^2}$


E $\sqrt[3]{12^2}$

11 Simplify $(x^2 + \sqrt{2}x - \sqrt{3})(x^2 - \sqrt{2}x + \sqrt{3})$. 

A $x^4 - 2x^2 + \sqrt{6}x - 3$

D $x^4 + 2x^2 + 2\sqrt{6}x + 3$

B $x^4 - 2x^2 + 2\sqrt{6}x - 3$

E  $x^4 - 2x^2 - 6x + 3$

C $x^4 + 2x^2 - 2\sqrt{6}x - 3$

12 $(1+\sqrt{2})^3 =$
 A $5+4\sqrt{2}$ B $7+4\sqrt{2}$ C $5+5\sqrt{2}$ D $7+5\sqrt{2}$ E $11+5\sqrt{2}$



13 If $x + \frac{1}{x} = \sqrt{5}$, $x^2 + \frac{1}{x^2} =$
 A $\sqrt{5}-2$ B 2 C 3 D 4 E 5



14 $(\frac{\sqrt{3}+1}{4})^2 + (\frac{\sqrt{3}-1}{4})^2 =$
 A $\frac{\sqrt{3}}{16}$ B $\frac{\sqrt{3}}{4}$ C $\frac{\sqrt{3}}{2}$ D $\frac{1}{4}$ E $\frac{1}{2}$



15 $2\sqrt{2-\sqrt{3}} =$
 A $\frac{\sqrt{6}-\sqrt{2}}{2}$ B $\sqrt{3}-1$ C $\sqrt{2}-\sqrt{6}$ D $\sqrt{6}-\sqrt{2}$ E $\sqrt{6}+\sqrt{2}$



16 If $p = \sqrt{2}$, express $\frac{\sqrt{12}-\sqrt{3}}{2\sqrt{6}}$ in terms of p .
 A p^3 B p^2 C $\frac{1}{p}$ D $\frac{1}{p^2}$ E $\frac{1}{p^3}$



[17] If $x = \frac{\sqrt{5}+1}{2}$, $x - \frac{1}{x} =$
 A 1 B $\sqrt{2}$ C $\frac{1}{2}$ D $\sqrt{5}$ E $\frac{\sqrt{5}}{2}$



[18] $\frac{\sqrt{7}-\sqrt{5}}{\sqrt{7}+\sqrt{5}} - \frac{\sqrt{5}+\sqrt{7}}{\sqrt{5}-\sqrt{7}} =$
 A -12 B $-2\sqrt{35}$ C $\sqrt{35}$ D $2\sqrt{35}$ E 12



[19] Rationalize $\frac{\sqrt{xy}}{x\sqrt{y}+y\sqrt{x}}$.

A $\frac{x\sqrt{y}-y\sqrt{x}}{\sqrt{xy}(x-y)}$ B $\frac{\sqrt{x}+\sqrt{y}}{x+y}$ C $\frac{1}{\sqrt{x}+\sqrt{y}}$ D $\frac{\sqrt{x}-\sqrt{y}}{x+y}$ E $\frac{\sqrt{x}+\sqrt{y}}{x-y}$



[20]

If $x = \frac{\sqrt{5} + \sqrt{2}}{\sqrt{3}}$ and $y = \frac{\sqrt{5} - \sqrt{2}}{\sqrt{3}}$, $x - y + \frac{x}{y} =$

A $\frac{1}{3}(7 + 2\sqrt{3} + \sqrt{10})$

B $\frac{1}{3}(7 + \sqrt{6} + \sqrt{10})$

C $\frac{1}{3}(7 + 2\sqrt{6} + 2\sqrt{10})$



$\frac{2\sqrt{6}}{3} + \sqrt{3}$

E

$\frac{2\sqrt{6}}{3} + \sqrt{10}$