



**gradeup**

Prep Smart. Score Better.

**ALGEBRA-1**

## Agenda

\* Basics of Algebraic  
formulas  $\rightarrow (60-65) \text{ min}$

\* Remaining Part of  
simplification  $\rightarrow \underline{\underline{25 \text{ min}}}$



# **ALGEBRAIC FORMULAS**

$$1. (a + b)^2 = a^2 + 2ab + b^2$$

$$2. (a - b)^2 = a^2 - 2ab + b^2$$

$$3. a^2 - b^2 = (a - b)(a + b)$$

$$(a+b)^2 + (a-b)^2 = 2(a^2 + b^2)$$

$$(a+b)^2 - (a-b)^2 = 4ab$$

Eg.  $\frac{(469 + 174)^2 - (469 - 174)^2}{469 \times 174} = ?$

(a) 2

(c) 295

☒ (b) 4

(d) 643

$$\frac{(a+b)^2 - (a-b)^2}{ab}$$

$$\frac{4ab}{ab}$$

**Ans. (b)**

Eg. Simplify :  $\frac{(359 + 256)^2 + (359 - 256)^2}{359 \times 359 + 256 \times 256}$

(a) 1089

(b) 615

(c) 516

(d) 2



$$\frac{(a+b)^2 + (a-b)^2}{a^2 + b^2} = \frac{2(a^2 + b^2)}{a^2 + b^2}$$



**Ans. (d)**

$$4. (a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$$

**Eg. If  $x + y + z = 13$**

$$\mathbf{x^2 + y^2 + z^2 = 71}$$

**Find :  $xy + yz + zx = ??$**

$$(x+y+z)^2 = (x^2+y^2+z^2) + 2(xy+yz+zx)$$

$$169 = 71 + 2K$$

$$K = 49$$

$$\underline{xy + yz + zx = 49}$$

Eg. If  $a + b + c = 20$   
 $a^2 + b^2 + c^2 = 100$   
 Find :  $ab + bc + ca = ??$

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$$

$$400 = 100 + 2(ab+bc+ca)$$

DATA INCONSISTENT

$$ab+bc+ca = \underline{\underline{150}} \quad \checkmark$$

\*

for Real values  
 of  $a, b, c$

$$a^2 + b^2 + c^2 \geq ab + bc + ca$$

I

II

$$a^2 + b^2 + c^2 \geq ab + bc + ca$$

Reason:

$$a^2 + b^2 + c^2 - ab - bc - ca$$

$$\frac{1}{2} [2a^2 + 2b^2 + 2c^2 - 2ab - 2bc - 2ca]$$

$$\frac{1}{2} [\underline{a^2} + \underline{a^2} + \underline{b^2} + \underline{b^2} + \underline{c^2} + \underline{c^2} - 2ab - 2bc - 2ca]$$

$$= \frac{1}{2} [\underline{(a-b)^2} + \underline{(b-c)^2} + \underline{(c-a)^2}] \geq 0$$

$$I - II \geq 0$$

$$I \geq II$$

$$5. (a + b)^3 = a^3 + b^3 + 3ab(a + b)$$

$$6. (a - b)^3 = a^3 - b^3 - 3ab(a - b)$$

$$(a + b)^3 + (a - b)^3 = 2(a^3 + 3ab^2)$$

$$(a + b)^3 - (a - b)^3 = 2(b^3 + 3a^2b)$$

Eg.  $\underline{0.8 \times 0.8 \times 0.8} + \underline{0.2 \times 0.2 \times 0.2} + \underline{3 \times 0.8 \times 0.2} = ?$

(a) 2

✓ (b) 1

(c) 27.634

(d) 2.7634

$$a^3 + b^3 + 3ab(a+b)$$

$$= (a+b)^3$$

$$= (0.8 + 0.2)^3 \Rightarrow 1$$



**Ans. (b)**



**Eg. Find the value of**  $(7 + 4\sqrt{3})^{-3} + (7 - 4\sqrt{3})^{-3}$

$$\rightarrow \left( \frac{1}{7+4\sqrt{3}} \right)^3 + \left( \frac{1}{7-4\sqrt{3}} \right)^3$$

$$\rightarrow (7-4\sqrt{3})^3 + (7+4\sqrt{3})^3$$

$$\rightarrow 2 \left[ (7)^3 + 3 \cdot 7 \cdot (4\sqrt{3})^2 \right]$$

$$2 \left[ 343 + 1008 \right] = \underline{\underline{2702}}$$

**Ans. 2702**

$$7. a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$\mathbf{x^3 + 1 = (x + 1) (x^2 - x + 1)}$$

$$8. a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

$$\mathbf{x^3 - 1 = (x - 1) (x^2 + x + 1)}$$

Eg.  $\left( \frac{147 \times 147 + 147 \times 143 + 143 \times 143}{147 \times 147 \times 147 - 143 \times 143 \times 143} \right) = ?$

(a)  $\frac{1}{4}$

(b) 290

(c)  $\frac{1}{290}$

(d) 4

$$\frac{a^2 + ab + b^2}{a^3 - b^3} = \frac{a^2 + \cancel{ab} + b^2}{(a-b)(a^2 + \cancel{ab} + b^2)}$$

$$\frac{1}{4} \checkmark$$

**Ans. (a)**

V.V. Anp

$$a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$$

or

$$= \frac{1}{2}(a + b + c)((a - b)^2 + (b - c)^2 + (c - a)^2)$$

$$* \quad \underline{a^3 + b^3 + c^3 - 3abc} = \underline{(a+b+c) (a^2 + b^2 + c^2 - ab - bc - ca)} \\ \text{OR} \\ \frac{1}{2} (a+b+c) [(a-b)^2 + (b-c)^2 + (c-a)^2]$$

$$(1) \quad a^2 + b^2 + c^2 - ab - bc - ca = \frac{1}{2} [(a-b)^2 + (b-c)^2 + (c-a)^2]$$

$(2) \quad \text{If } a+b+c=0$ $\downarrow$ <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> <math display="block">a^3 + b^3 + c^3 = 3abc</math> </div>	$\text{If } \boxed{a^2 + b^2 + c^2 - ab - bc - ca = 0}$ $\Downarrow$ $\underline{a=b=c}$ $\Downarrow$ $a^3 + b^3 + c^3 = 3abc$
---	--



eg 1

Find the

If  $\underline{a^2 + b^2 + c^2 - ab - bc - ca = 0}$

value of

$$\frac{3a^2 - 5b^2 + 7c^2}{4a^2 + 6b^2 + 10c^2}$$

Sol<sup>n</sup>  $\rightarrow$

$$a = b = c$$

$$\frac{5a^2}{20a^2}$$

$$\pm \frac{1}{4}$$

eg 2

Find

If  $a^2 + b^2 + c^2 - ab - bc - ca = 0$

the value of

$$\frac{2a^2 + 3b^2 + 5c^2}{4a - 3b + c}$$

Sol<sup>n</sup>  $\rightarrow$

$$\frac{10a^2}{2a} \Rightarrow 5a$$

Can't be determined



Eg

$$a = 19$$

$$b = -12$$

$$c = -7$$

$$19^3 - 12^3 - 7^3 = ??$$

$$a + b + c = 0$$

$$a^3 + b^3 + c^3 = 3abc$$

$$3(19)(-12)(-7)$$

$$= 57 \times 84$$

$$= \underline{4788}$$

Eg. Find the value of :  $52^3 - 27^3 - 25^3$

$$a = 52$$

$$b = -27$$

$$c = -25$$

$$3(\underline{52})(-27)(\underline{-25})$$

$$1300 \times 81$$

$$= \underline{\underline{105300}}$$

Ans. 105300

$$N \times 25$$

→ shortcut

$$N \times \frac{100}{4}$$

eg

$$25 \times (52)$$

$$1300$$

eg

$$(92) \times 25$$

$$2300$$

**Eg. If**  $\frac{m^2 + p^2 + k^2}{mp + pk + km} = 1$

**Find**  $\frac{m+p}{k} + \frac{m+k}{p} + \frac{p+k}{m} = ??$

$$m^2 + p^2 + k^2 - mp - pk - km = 0$$

$$\underline{m = p = k}$$

$$2 + 2 + 2 = \underline{\underline{6}} \quad \checkmark$$

**Ans. 6**

Eg. If  $a = 93$ ,  $b = 103$ ,  $c = 98$   
 $a^2 + b^2 + c^2 - ab - bc - ca = ??$

93, 98, 103  
 Gap  $\rightarrow$  same

$$a^2 + b^2 + c^2 - ab - bc - ca = \frac{1}{2} \left[ (a-b)^2 + (b-c)^2 + (c-a)^2 \right]$$

If Gap = same

$$a^2 + b^2 + c^2 - ab - bc - ca = 3 \cdot (\text{Gap})^2$$

$$= \frac{1}{2} \left[ 100 + 25 + 25 \right]$$

$$= \underline{\underline{75}}$$



Ans. 75

$$\text{If } a = 80 \quad b = 84 \quad c = 88$$

$$a^2 + b^2 + c^2 - ab - bc - ca$$

$$\rightarrow 3[4]^2$$

$$\Rightarrow \underline{\underline{48}} \quad \checkmark$$

Eg. If  $a = 50$ ,  $b = 54$ ,  $c = 56$   
 $a^3 + b^3 + c^3 - 3abc = ??$

$$\frac{1}{2} (a+b+c) \left[ (a-b)^2 + (b-c)^2 + (c-a)^2 \right]$$

$$\Rightarrow \frac{1}{2} \left[ \begin{matrix} 80 \\ 160 \end{matrix} \right] [16 + 4 + 36]$$

$$80 \times 56$$

$$= \underline{\underline{4480}}$$



**Ans. 4480**

Eg. If  $a + b + c = 15$ ,  $a^2 + b^2 + c^2 = 83$

$a^3 + b^3 + c^3 - 3abc = ??$

$$= (a+b+c) (a^2+b^2+c^2 - ab - bc - ca)$$

$$= 15 \cdot (83 - 71)$$

$$= 15 \cdot 12 \Rightarrow \underline{\underline{180}}$$

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$$

$$225 = 83 + 2(ab + bc + ca)$$

$$ab + bc + ca = 71$$

**Ans. 180**

Eg. 
$$\frac{(34)^3 + (30)^3 + (36)^3 - 3 \times 34 \times 30 \times 36}{(34)^2 + (30)^2 + (36)^2 - 34 \times 30 - 34 \times 36 - 30 \times 36} = ?$$

(a) 3352

(b) 1296

☒ (c) 100

(d) 1156

$$a^3 + b^3 + c^3 - 3abc$$

$$a^2 + b^2 + c^2 - ab - bc - ca$$

$$\Rightarrow (a + b + c)$$

$$\Rightarrow \underline{\underline{100}}$$

**Ans. (c)**

**Eg.** If  $a = 6$ ,  $b = -7$ ,  $c = -5$

**Find :**  $\frac{a^3 + b^3 + c^3 - 3abc}{a^2 + b^2 + c^2 - ab - bc - ca} = ??$

$$a + b + c = \underline{\underline{-6}} \quad \checkmark$$

eg

If

$$a = 7 \quad b = -3 \quad c = -5$$

$$\frac{a^3 + b^3 + c^3 - 3abc}{(a-b)^2 + (b-c)^2 + (c-a)^2} = ??$$

$$\Rightarrow \frac{1}{2} (a + b + c) = \boxed{-\frac{1}{2}}$$

**Ans.      $-6$**

**Eg. If  $a - b = 9$ ,  $b - c = 7$ ,  $c - a = 5$**

**Find :**  $\frac{a^3 + b^3 + c^3 - 3abc}{(a + b + c)} = ??$

$$\frac{1}{2} [(a-b)^2 + (b-c)^2 + (c-a)^2]$$

$$= \frac{1}{2} [81 + 49 + 25]$$

$$= \frac{155}{2}$$

~~A  $\frac{155}{2}$~~

B  $\frac{145}{2}$

C  $\frac{165}{2}$

D  $\frac{175}{2}$

Given by SSC



Ans. Data inconsistent

$$A \quad 15\frac{5}{2}$$

$$B \quad 16\frac{5}{2}$$

$$C \quad 17\frac{5}{2}$$

D Data Inconsistent

$$\left. \begin{array}{l} a-b=9 \\ b-c=7 \\ c-a=5 \end{array} \right\} \begin{array}{l} \textcircled{1} \\ \textcircled{2} \\ \textcircled{3} \end{array}$$

$$\underline{0=21}$$

→ This is not possible

Data is Wrong

# **SIMPLIFICATION**

Two hand-drawn blue arrows are positioned below the word "SIMPLIFICATION". The first arrow starts under the 'S' and points to the right, ending under the 'I'. The second arrow starts under the 'I' and points to the right, ending under the 'N'.

**Q25.**  $999\frac{1}{7} + 999\frac{2}{7} + 999\frac{3}{7} + 999\frac{4}{7} + 999\frac{5}{7} + 999\frac{6}{7}$  is simplified to :

(a) 5997

(b) 5979

(c) 5994

(d) 2997

$$4 - \frac{5}{1 + \frac{1}{3 + \frac{4}{9}}}$$

$$4 - \frac{5}{1 + \frac{9}{31}}$$

$$4 - \frac{8 \cdot 31}{408}$$

$$= \frac{4}{8} \quad \checkmark$$

Q26. The value of  $4 - \frac{5}{1 + \frac{1}{3 + \frac{1}{2 + \frac{1}{4}}}}$  is

(a)  $\frac{1}{8}$

(b)  $\frac{1}{64}$

(c)  $\frac{1}{16}$

(d)  $\frac{1}{32}$

$$1^2 = 1$$

$$(11)^2 = 121$$

$$(111)^2 = 12321$$

$$(1111)^2 = 1234321$$

Q27. The value of  $(11111)^2$  is

(a) 12344321

(b) 121212121

(c) 123454321

(d) 11344311



Note

$$12345679 \times (9K)$$

$$= KKKKKKKK$$

(9 times)

Q28. 12345679  $\times$  72 is equal to :

(a) 88888888

(b) 999999998

(c) 888888888

(d) 898989898

$$\rightarrow 88888888$$

eg  $12345679 \times \underline{54}$

$$= 66666666$$



$$2\frac{11}{13} = 2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}}$$

$$x + \frac{1}{y + \frac{1}{z}} = \frac{13}{11}$$

$$x + \frac{1}{y + \frac{1}{z}} = 1 + \frac{2}{11}$$

$$x = 1$$

**Q29.** If  $\frac{37}{13} = 2 + \frac{1}{x + \frac{1}{y + \frac{1}{z}}}$ ,

where  $x, y, z$  are natural numbers, then  $x, y, z$  are:

(a) 1, 2, 5

(b) 1, 5, 2

(c) 5, 2, 11

(d) 11, 2, 5

$$y + \frac{1}{z} = \frac{11}{2}$$

$$y + \frac{1}{z} = 5 + \frac{1}{2}$$

$$y = 5, z = 2$$



**Ans. (b)**

## SQUARE ROOT OF IRRATIONAL NUMBERS

Eg.  $\sqrt{7 + 4\sqrt{3}} = ??$

$$\sqrt{7 + 4\sqrt{3}} = \sqrt{(a+b)^2} \Rightarrow a+b$$

$$\underline{7 + 4\sqrt{3}} = \underline{a^2 + b^2} + \underline{2ab}$$

$$\begin{cases} a^2 + b^2 = 7 \\ ab = 2\sqrt{3} \end{cases}$$

$$a = 2 \quad b = \sqrt{3}$$

$$\rightarrow \underline{\underline{2 + \sqrt{3}}}$$

eg

$$\sqrt{19+8\sqrt{3}}$$

$$19+8\sqrt{3} = a^2+b^2+2ab$$

$$a^2+b^2=19$$

$$\underline{a} \underline{b} = \underline{4\sqrt{3}}$$

$$\longrightarrow \underline{\underline{4+\sqrt{3}}}$$

eg

$$\sqrt{27-10\sqrt{2}}$$

$$27-10\sqrt{2} = a^2+b^2-2ab$$

$$a^2+b^2=27$$

$$\underline{a} \underline{b} = \underline{5\sqrt{2}}$$

$$\longrightarrow \underline{\underline{5-\sqrt{2}}}$$

Eg.  $\sqrt{37 + 20\sqrt{3}} = ??$

$$37 + 20\sqrt{3} = a^2 + b^2 + 2ab$$

$$\underline{a^2 + b^2} = 37$$

$$ab = 10\sqrt{3}$$

$$\underline{ab} = \underline{2 \cdot 5 \cdot \sqrt{3}}$$

$$a \cdot b = (2\sqrt{3}) \cdot \underline{5}$$

$$\rightarrow \underline{2\sqrt{3} + 5}$$

Eg.  $\sqrt{33 - 20\sqrt{2}} = ??$

$$\underline{a^2 + b^2} = 33$$

$$ab = 10\sqrt{2}$$

$$= 2 \cdot 5 \cdot \sqrt{2}$$

$$a \cdot b = \underline{2\sqrt{2}} \cdot \underline{5}$$

↓

$$\underline{2\sqrt{2}} - \underline{5} \quad \times$$

$$5 - 2\sqrt{2} \quad \checkmark$$



$$\sqrt{9-4\sqrt{5}} \Rightarrow \sqrt{5}-2$$

$$M = \sqrt{3-\cancel{\sqrt{5}}+\cancel{\sqrt{5}}-2}$$

$$\boxed{M = 1}$$

$$\sqrt{11-4\sqrt{7}} = \sqrt{7}-2$$

$$N = \sqrt{\cancel{\sqrt{7}}-1-\cancel{\sqrt{7}}+2}$$

$$\boxed{N = 0}$$

**Q30. If**  $M = \sqrt{3-\sqrt{5}+\sqrt{9-4\sqrt{5}}}$   
**and**  $N = \sqrt{\sqrt{7}-1-\sqrt{11-4\sqrt{7}}}$

**What is the value of**  $\frac{M-N}{M+N}$ ?

☒ (a) 0

(c) -1

(b) 1

(d) None of these

$$\frac{1-1}{1+1} = \underline{\underline{0}}$$

**Ans. (b)**



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

$$\sqrt{4+2\sqrt{3}} = \sqrt{3+1}$$

**Note :**

$$\sqrt{2+\sqrt{3}} = \frac{\sqrt{3}+1}{\sqrt{2}}$$

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



# **SIMPLIFICATION PRACTICE QUESTIONS**

Q1.  $\sqrt{1 + \sqrt{1 + \sqrt{1 + \dots}}}$

- (a) equals 1
- (b) lies between 0 and 1
- (c) lies between 1 and 2
- (d) is greater than 2

**Ans. (c)**

**Q2. If  $m = \sqrt{5 + \sqrt{5 + \sqrt{5 + \dots}}}$  and  $n = \sqrt{5 - \sqrt{5 - \sqrt{5 - \dots}}}$ , then among the following the relation between m and n holds is**

<b>(a) <math>m - n + 1 = 0</math></b>	<b>(b) <math>m + n - 1 = 0</math></b>
<b>(c) <math>m + n + 1 = 0</math></b>	<b>(d) <math>m - n - 1 = 0</math></b>

**Ans. (d)**



**Q3. Find the value of  $\sqrt{63 - 2\sqrt{63 - 2\sqrt{63 - 2\sqrt{63 - \dots}}}}$ ??**

**Ans. 7**

V. imp  
✓

Q4. The value of

$$\frac{1}{\sqrt{(12 - \sqrt{140})}} - \frac{1}{\sqrt{(8 - \sqrt{60})}} - \frac{2}{\sqrt{10 + \sqrt{84}}} \text{ is :}$$

(a) 0

(b) 1

(c) 2

(d) 3

**Ans. ()**

✓ - Ans  
✓ Q5.

If  $x = 5 - \sqrt{21}$ , then the value of  $\frac{\sqrt{x}}{\sqrt{32 - 2x} - \sqrt{21}}$

(a)  $\frac{1}{\sqrt{2}}(\sqrt{3} - \sqrt{7})$       (b)  $\frac{1}{\sqrt{2}}(\sqrt{7} - \sqrt{3})$

(c)  $\frac{1}{\sqrt{2}}(\sqrt{7} + \sqrt{3})$       (d)  $\frac{1}{\sqrt{2}}(7 - \sqrt{3})$

**Ans. ()**

**Q6. Find the value of**  $\frac{1}{5} + 999\frac{494}{495} \times 99$

**(a) 90000**

**(b) 99000**

**(c) 90900**

**(d) 99990**



**Ans. ()**

**Q7.**  $\left(999\frac{999}{1000} \times 7\right)$  is equal to:

(a)  $6993\frac{7}{1000}$

(b)  $7000\frac{7}{1000}$

(c)  $6633\frac{7}{1000}$

(d)  $6999\frac{993}{1000}$

**Ans. ()**

Q8. The value of  $1 - \frac{a}{1 - \frac{1}{1 + \frac{a}{1 - a}}}$  is

- (a)  $a$   
(c)  $1$

- (b)  $1 - a$   
(d)  $0$

**Ans. ()**

**Q9. The smallest of  $\sqrt{8} + \sqrt{5}$  ,  $\sqrt{7} + \sqrt{6}$  ,  $\sqrt{10} + \sqrt{3}$  and  $\sqrt{11} + \sqrt{2}$  is :**

(a)  $\sqrt{8} + \sqrt{5}$

(b)  $\sqrt{7} + \sqrt{6}$

(c)  $\sqrt{10} + \sqrt{3}$

(d)  $\sqrt{11} + \sqrt{2}$

**Ans. ()**

**Q10. The greatest among  $\sqrt{7} - \sqrt{5}$ ,  $\sqrt{5} - \sqrt{3}$ ,  $\sqrt{9} - \sqrt{7}$ ,  $\sqrt{11} - \sqrt{9}$  is**

(a)  $\sqrt{7} - \sqrt{5}$

(b)  $\sqrt{5} - \sqrt{3}$

(c)  $\sqrt{9} - \sqrt{7}$

(d)  $\sqrt{11} - \sqrt{9}$



**Ans. ()**

**Q11. The smallest among the numbers  $2^{250}$ ,  $3^{150}$ ,  $5^{100}$  and  $4^{200}$**

**(a)  $4^{200}$**

**(b)  $5^{100}$**

**(c)  $3^{150}$**

**(d)  $2^{250}$**

**Ans. ()**

**Q12. Arranging the following in ascending order  $3^{34}$ ,  $2^{51}$ ,  $7^{17}$  we get**

**(a)  $3^{34} > 2^{51} > 7^{17}$**

**(b)  $7^{17} > 2^{51} > 3^{34}$**

**(c)  $3^{34} > 7^{17} > 2^{51}$**

**(d)  $2^{51} > 3^{34} > 7^{17}$**

**Ans. ()**

**Q13. The simplified value of :**

$$\left\{ \left( 1 + \frac{1}{10 + \frac{1}{10}} \right) \left( 1 + \frac{1}{10 + \frac{1}{10}} \right) - \left( 1 - \frac{1}{10 + \frac{1}{10}} \right) \left( 1 - \frac{1}{10 + \frac{1}{10}} \right) \right\} \div \left\{ \left( 1 + \frac{1}{10 + \frac{1}{10}} \right) \left( 1 - \frac{1}{10 + \frac{1}{10}} \right) \right\}$$

(a)  $\frac{4040}{10101}$

(b)  $\frac{100}{101}$

(c) 2

(d)  $\frac{90}{101}$

**Ans. ()**

**Q14. The ascending order of**

$(2.89)^{0.5}$ ,  $2 - (0.5)^2$ ,  $\sqrt{3}$  and  $\sqrt[3]{0.008}$  is

- (a)  $2 - (0.5)^2$ ,  $\sqrt{3}$ ,  $\sqrt[3]{0.008}$ ,  $(2.89)^{0.5}$
- (b)  $\sqrt[3]{0.008}$ ,  $(2.89)^{0.5}$ ,  $\sqrt{3}$ ,  $2 - (0.5)^2$
- (c)  $\sqrt[3]{0.008}$ ,  $\sqrt{3}$ ,  $(2.89)^{0.5}$ ,  $2 - (0.5)^2$
- (d)  $\sqrt{3}$ ,  $\sqrt[3]{0.008}$ ,  $2 - (0.5)^2$ ,  $(2.89)^{0.5}$



**Ans. ( )**

**Q15. What is the value of :**

$$\left[ \frac{1}{\sqrt{9} - \sqrt{8}} \right] - \left[ \frac{1}{\sqrt{8} - \sqrt{7}} \right] + \left[ \frac{1}{\sqrt{7} - \sqrt{6}} \right] - \left[ \frac{1}{\sqrt{6} - \sqrt{5}} \right] + \left[ \frac{1}{\sqrt{5} - \sqrt{4}} \right]$$

**(a) 6**

**(b) 5**

**(c) -7**

**(d) -1**

**Ans. (b)**

**Q16.** If  $\frac{97}{19} = a + \frac{1}{b + \frac{1}{c}}$ ,

where  $a$ ,  $b$  and  $c$  are positive integers, then what is the sum of  $a$ ,  $b$  and  $c$ ?

(a) 16

(b) 9

(c) 20

(d) 18

**Ans. (a)**

**Q17. Find the value of expression of :**

$$\frac{4^n \times 20^{m-1} \times 12^{m-n} \times 15^{m+n-2}}{16^m \times 5^{2m+n} \times 9^{m-1}}$$

**(a) 500**

**(b) 1**

**(c) 200**

**(d) 1/500**

**Ans. (d)**

**Q18. Find the square root of  $7 + \sqrt{48}$**

(a)  $2 - \sqrt{3}$

(b)  $2 + \sqrt{3}$

(c)  $3 + \sqrt{2}$

(d)  $3 - \sqrt{2}$



**Ans. (b)**

$$\begin{array}{r} 1.224 \\ 2.448 \times 9 \\ \hline \end{array}$$

$$\underline{\underline{11.016}}$$

Q19. If  $\sqrt{6} = 2.449$ , then the value of

$$\frac{\sqrt{6}}{2} - \frac{12}{\sqrt{6}} + \sqrt{216} \text{ is equal to:}$$

- (a) 11.021  
(c) 13.079

- (b) 12.067  
(d) 12.187

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

$$\frac{\sqrt{6}}{2} + 4\sqrt{6}$$

$$\sqrt{6} \cdot \frac{9}{2} = 2.449 \times \frac{9}{2}$$

**Ans. (a)**

**Q20. Find the value of:**

$$\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right) \dots \dots \dots \left(1 - \frac{1}{100}\right)$$

(a)  $\frac{1}{5}$

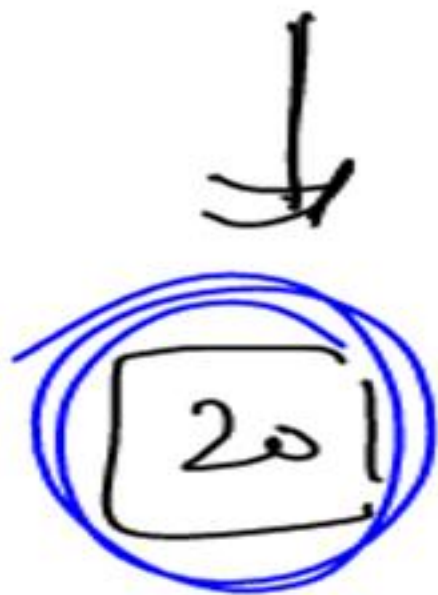
(b)  $\frac{1}{10}$

(c)  $\frac{1}{50}$

(d)  $\frac{2}{5}$

10000 (SSC)

↓  
Main focus  
9500 (Shortcut)



20  
19 9800

80<sup>4</sup>  
800

1 : 76

↓  
Main focus  
500 (Concepts)

