

65. If $a + b = 10$ and $\sqrt{\frac{a}{b}} - 13 = -\sqrt{\frac{b}{a}} - 11$, then what is the value of $3ab + 4a^2 + 5b^2$?

यदि $a + b = 10$ और $\sqrt{\frac{a}{b}} - 13 = -\sqrt{\frac{b}{a}} - 11$ है, तो $3ab + 4a^2 + 5b^2$ का मान क्या है?

[A] 450

☒ [B] 300

[C] 600

[D] 750

$$= 12 \times 5^2 = 300$$

$$\frac{a}{5} + \frac{b}{5} = 10$$

$$\sqrt{\frac{a}{b}} + \sqrt{\frac{b}{a}} = 2$$

$$\Rightarrow a = b$$

66. If $3\sqrt{\frac{1-a}{a}} + 9 = 19 - 3\sqrt{\frac{a}{1-a}}$, then what is the value of a ?

यदि $3\sqrt{\frac{1-a}{a}} + 9 = 19 - 3\sqrt{\frac{a}{1-a}}$, है, तो a का मान क्या है?

[A] ~~3/10, 7/10~~

[C] 2/5, 3/5

[B] 1/10, 9/10

[D] 1/5, 4/5

$$x + \frac{1}{x} = 3 + \frac{1}{3}$$

$$x = 3, \frac{1}{3}$$

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

$$\frac{1-a}{a} = 9$$

$$1 = 10a$$

$$\frac{1}{10} = a$$

$$3\sqrt{\frac{1-a}{a}} + 3\sqrt{\frac{a}{1-a}} = 19 - 9$$

$$\sqrt{\frac{1-a}{a}} + \sqrt{\frac{a}{1-a}} = \frac{10}{3}$$

$$x + \frac{1}{x} = \frac{10}{3}$$

67. If $\sqrt{\frac{x}{y}} + \frac{1}{\sqrt{2}} = \sqrt{\frac{y}{x}}$ and $x + y = 18$, then what is the value of xy ?

यदि $\sqrt{\frac{x}{y}} + \frac{1}{\sqrt{2}} = \sqrt{\frac{y}{x}}$ और $x + y = 18$ है, तो xy का मान क्या है?

[A] 80

[B] 45

[C] 56

[D] 72 ✓

$$\sqrt{\frac{y}{x}} - \sqrt{\frac{x}{y}} = \frac{1}{\sqrt{2}}$$

$$x + y = 18$$

6 12

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

$$a = \sqrt{2} \Rightarrow \frac{y}{x} = 2$$

67. If $\sqrt{\frac{x}{y}} + \frac{1}{\sqrt{2}} = \sqrt{\frac{y}{x}}$ and $x + y = 18$, then what is the value of xy ?

यदि $\sqrt{\frac{x}{y}} + \frac{1}{\sqrt{2}} = \sqrt{\frac{y}{x}}$ और $x + y = 18$ है, तो xy का मान क्या है?

[A] 80

[B] 45

[C] 56

[D] 72

$$\sqrt{\frac{y}{x}} - \sqrt{\frac{x}{y}} = \frac{1}{\sqrt{2}}$$

$$x + y = 18$$

$$\sqrt{\frac{y}{x}} + \sqrt{\frac{x}{y}} = \frac{3}{\sqrt{2}} \Rightarrow \frac{18}{\sqrt{xy}} = \frac{3}{\sqrt{2}}$$

$$\sqrt{xy} = 6\sqrt{2}$$

68. If $\sqrt{\frac{a}{b}} = \frac{8}{3} + \sqrt{\frac{b}{a}}$ & $(a + b) = 30$, then what is the value of ab ?

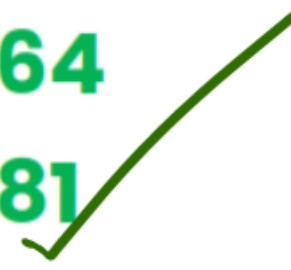
यदि $\sqrt{\frac{a}{b}} = \frac{8}{3} + \sqrt{\frac{b}{a}}$ & $(a + b) = 30$, तो ab का मान क्या है?

[A] 64

[B] 28

[C] 81

[D] 26





Misc.



69. If $x = 2 + \sqrt{3}$, $y = 2 - \sqrt{3}$, $z = 1$, then what is the value of $\left(\frac{x}{yz}\right) + \left(\frac{y}{xz}\right) + \left(\frac{z}{xy}\right) + 2\left[\left(\frac{1}{x}\right) + \left(\frac{1}{y}\right) + \left(\frac{1}{z}\right)\right]$?

यदि $x = 2 + \sqrt{3}$, $y = 2 - \sqrt{3}$, तथा $z = 1$ है, तो $\left(\frac{x}{yz}\right) + \left(\frac{y}{xz}\right) + \left(\frac{z}{xy}\right) + 2\left[\left(\frac{1}{x}\right) + \left(\frac{1}{y}\right) + \left(\frac{1}{z}\right)\right]$ का मान क्या है?

[A] 25
[C] 17

[B] 22
[D] 43

$$= \frac{x^2 + y^2 + z^2 + 2[yz + zx + xy]}{xyz}$$

$$= \frac{(x+y+z)^2}{xyz}$$

70. If $x = (\sqrt{5}) + 1$ and $y = (\sqrt{5}) - 1$, then what is the value of $\left(\frac{x^2}{y^2}\right) + \left(\frac{y^2}{x^2}\right) + 4\left(\frac{x}{y}\right) + 4\left(\frac{y}{x}\right) + 6$?

यदि $x = (\sqrt{5}) + 1$ तथा $y = (\sqrt{5}) - 1$ है, तो $\left(\frac{x^2}{y^2}\right) + \left(\frac{y^2}{x^2}\right) + 4\left[\left(\frac{x}{y}\right) + \left(\frac{y}{x}\right)\right] + 6$ का मान क्या है?

[A] 31

[B] $23\sqrt{5}$

[c] $27\sqrt{5}$

[D] 25

$$7 + 12 + 6$$

$$\frac{x}{y} + \frac{y}{x} = \frac{\sqrt{5}+1}{\sqrt{5}-1} + \frac{\sqrt{5}-1}{\sqrt{5}+1}$$
$$= \frac{2 \times 6}{4}$$
$$= 3$$

71. Given that x, y, z are positive real numbers, if $(x + y)^2 - z^2 = 130$, $(y + z)^2 - x^2 = 150$ and $(x + z)^2 - y^2 = 120$, then x is:

दिया गया है कि x, y, z धनात्मक वास्तविक संख्याएं हैं, यदि $(x + y)^2 - z^2 = 130$, $(y + z)^2 - x^2 = 150$ और $(x + z)^2 - y^2 = 120$ है, तो x किसके समान होगा?

[A] $\frac{35}{8}$
[C] $\frac{15}{2}$

[B] $\frac{25}{4}$
[D] $\frac{16}{3}$

$$(x+y+z) \cdot (x+y-z) = 130$$

$$(y+z+x) \cdot (y+z-x) = 150$$

$$(x+z+y) \cdot (x+z-y) = 120$$

$$(x+y+z)^2 = 400$$

$$x+y+z=20$$

$$y+z-x=15$$

घटा

$$2x = 25$$

$$x = \frac{25}{2}$$

72. If $\frac{ab}{a+b} = \frac{1}{3}$, $\frac{bc}{b+c} = \frac{1}{4}$, $\frac{ca}{c+a} = \frac{1}{5}$, then find the value of $\frac{abc}{ab+bc+ca}$?
 यदि $\frac{ab}{a+b} = \frac{1}{3}$, $\frac{bc}{b+c} = \frac{1}{4}$, $\frac{ca}{c+a} = \frac{1}{5}$ है, तो $\frac{abc}{ab+bc+ca}$ का मान ज्ञात कीजिये?

[A] $\frac{1}{6}$ [B] $\frac{1}{12}$
 [C] 6 [D] $\frac{1}{4}$

(CGL MAINS 20/5)

$$\frac{a+b}{ab} = 3 \Rightarrow \frac{1}{a} + \frac{1}{b} = 3$$

$$\frac{1}{b} + \frac{1}{c} = 4$$

$$\frac{1}{c} + \frac{1}{a} = 5$$

$$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 12$$

$$\frac{bc+ca+ab}{abc} = 6$$

73. If $(x + 5)(x + 6) + \frac{9}{x(x-1)} = 0$, then $2x^2 + 10x + 7 = ?$

यदि $(x + 5)(x + 6) + \frac{9}{x(x-1)} = 0$ है, तो $2x^2 + 10x + 7 = ?$

[A] 10

[B] 11

[C] 13

[D] 17

$$= 2 \cdot (x^2 + 5x) + 7$$

$$= 2 \times 3 + 7$$

$$x \cdot (x-1) (x+5)(x+6) + 9 = 0$$

$$(x^2 + 5x) \cdot (x^2 + 5x - 6) + 9 = 0$$

$$y \cdot (y - 6) + 9 = 0$$

$$y^2 - 6y + 9 = 0 \Rightarrow (y - 3)^2 = 0$$

माना, $x^2 + 5x = y = 3$

Equation $\rightarrow$ variables $\rightarrow a, b, c, x, y, z, \dots$
constant $\rightarrow$ actual no's

$$\begin{array}{r} a+b=9 \\ a-b=1 \\ \hline a=5, b=4 \end{array}$$

$$3x - 12$$

Algebraic expression

$$x^2y^2 - yz + 6x^3$$

$$ab + bc + ca + abc$$

$$x^2 - y = (x-3)(x+3)$$

Equation $\Rightarrow$

$$3x - 12 = 0$$

$$\Rightarrow x = \frac{12}{3} = 4$$

$$a+b+c=10$$

$$\begin{array}{ccc} 1 & 2 & 7 \\ 2 & 4 & 4 \\ 8 & 1 & 1 \end{array}$$



VALUE PUTTING

अगर किसी सवाल में Equations कम और Variable ज्यादा हो वहाँ value Putting apply करते है। लेकिन Value Putting का use करते समय $\frac{0}{0}, \frac{1}{0}$, Undefined, not Possible Form नहीं बननी चाहिए। 

EXAMPLE

if,

$$a + b = 7$$

$$\begin{array}{l} 7 \\ 6 \\ 9 \end{array} \quad \begin{array}{l} 0 \\ 1 \\ -2 \end{array}$$

तो $3a + 3b = 21$
 $18 + 3 = 21$
 $27 - 6 = 21$
...

a और b का मान सात नहीं कर सकते

(a) 20

(b) 21

(c) 24

(d) 27



STEP

- (i) सबसे पहले किसी एक Variable को 0 करो अगर सवाल easy नहीं हो रहा तो next Variable को 0 करो।
- (ii) अगर Variable की Value 0 नहीं कर पा रहे तो, 1, -1, 2, सुविधानुसार रखेंगे।

formula verification $\div$

$$L.H.S = R.H.S \text{ (always)}$$

pret
 $a=2$
 $b=3$

$$(a+b)^2 = a^2 + b^2 + 2ab$$
$$(2+3)^2 = 4 + 9 + 12$$
$$25 = 25$$

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

25

- ~~a) $a^2 + ab + b^2 \rightarrow 19$~~
- ☒ b) $a^2 + 2ab + b^2 \rightarrow 25$
- ~~c) $a^2 + 2ab + 2b^2$~~
- ~~d) $a + b + a^2b^2$~~



1. If $a - b = 9$, then the value of $(a-31)^3 - (b-22)^3$ is:
यदि $a - b = 9$ है, तो $(a-31)^3 - (b-22)^3$ का मान ज्ञात कीजिए।

✓ [A] 0

[B] 343

[C] 2863

[D] 392

$a - b = 9$
9 - 0
31 - 22
⋮
1 eqn
a, b variables

~~$(-22)^3 + 22^3$~~
0 - 0

2. If $x + y = 41$, then find $(x - 20)^{2021} + (y - 21)^{2021}$?

यदि $x + y = 41$ है, तो $(x - 20)^{2021} + (y - 21)^{2021}$ ज्ञात कीजिये?

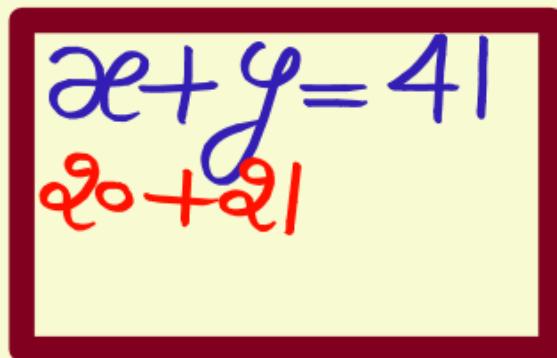
[A] 0

[B] 1

[C] 2

[D] 3

0+0


$$x + y = 41$$
$$20 + 21$$

3. If $a = x + \frac{2}{x}$ and $b = x - \frac{2}{x}$, then find the value of $a^4 + b^4 - 2a^2b^2$.

यदि $a = x + \frac{2}{x}$ और $b = x - \frac{2}{x}$ है, तो $a^4 + b^4 - 2a^2b^2$ का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2026)

[A] 36

[B] 64

[C] 16

[D] 49

$$81 + 1 - 18 = 64$$

$$a = x + \frac{2}{x} = 3$$

$$b = x - \frac{2}{x} = -1$$

$$\text{but } x = 1$$

4. Simplify $(5z-7y)^2 + (7z+5y)^2 - 49z^2$.

$(5z-7y)^2 + (7z+5y)^2 - 49z^2$ को सरल कीजिए।

(SSC CGL MAINS 2024) (RRB Technician Grade-3 2025)

[A] $25z^2 + 74y^2$ ✓

[B] $35z^2 + 70y^2$ ✗

[C] $26z^2 + 82y^2$ ✗

[D] $30z^2 + 83y^2$ ✗

put $z=0$

$$49y^2 + 25y^2 = 74y^2$$



5. If $a + b = 2c$, then the value of $\frac{a}{a-c} + \frac{c}{b-c}$ is:

यदि $a + b = 2c$ है, तो $\frac{a}{a-c} + \frac{c}{b-c}$ का मान क्या होगा?

[A] $\frac{1}{2}$

put $c=0$

[B] 1

[C] 0

$\Rightarrow b = -a$

[D] -1

$$1+0=1$$

+2 चर
एक $\rightarrow$ 1 eqⁿ
 a, b, c variables

5. If $a + b = 2c$, then the value of $\frac{a}{a-c} + \frac{c}{b-c}$ is:

यदि $a + b = 2c$ है, तो $\frac{a}{a-c} + \frac{c}{b-c}$ का मान क्या होगा?

[A] $\frac{1}{2}$

[B] 1

[C] 0

[D] -1

$$a + b = c + c$$

$$a - c = c - b$$

$$-(a - c) = b - c$$

$$\frac{a}{a-c} - \frac{c}{a-c}$$

$$= \frac{\cancel{a} - \cancel{c}}{\cancel{a} - \cancel{c}} = 1$$

6. If $x+y=2z$, then $\frac{x}{x-z} + \frac{y}{y-z} = ?$

यदि $x+y=2z$ है, तो $\frac{x}{x-z} + \frac{y}{y-z} = ?$

[C] 0

[C] 2

$$1+1=2$$

[D] 1

[D] 3

put $z=0$

$$y = -x$$

7. If $\alpha + \beta + \gamma = 0$, then find $\frac{3\beta^2 + \alpha^2 + \gamma^2}{2\beta^2 - \alpha\gamma}$?

यदि $\alpha + \beta + \gamma = 0$, तो $\frac{3\beta^2 + \alpha^2 + \gamma^2}{2\beta^2 - \alpha\gamma}$ ज्ञात करें?

SSC CPO 2024

[A] $1/2$

[C] 2 ✓

[B] 1

[D] $1/4$

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

त्रै-पर $\rightarrow$ 1 eqⁿ
जैसे α, β, γ

8. If $x + y + z = 0$, then find the value of $\frac{x^2}{x^2 - yz} + \frac{y^2}{y^2 - zx} + \frac{z^2}{z^2 - xy}$.

यदि $x + y + z = 0$ हो तो $\frac{x^2}{x^2 - yz} + \frac{y^2}{y^2 - zx} + \frac{z^2}{z^2 - xy}$ का मान ज्ञात करें।

[A] 2

[B] 1

[C] 3

[D] 0

put $z = 0$

$= 1 + 1$

$y = -x$

9. If $a+b+c=0$, then $\frac{a^2+b^2+c^2}{(a-b)^2+(b-c)^2+(c-a)^2}=?$

यदि $a+b+c=0$ है, तो $\frac{a^2+b^2+c^2}{(a-b)^2+(b-c)^2+(c-a)^2}=?$

[A] 1

[C] $\frac{1}{3}$

but $c=0$

$b=-a$

[B] 3

[D] 0

$\frac{a^2+b^2}{a^2+b^2} = \frac{1}{3}$