ALGBERA

बीजगणित

SHEET-03

CLASS NOTES

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CONCEPT OF SYMMETRY

* $ab+bc$ → Same degree.

Symmetricity

1. If $xy + yz + zx = 1$, then $\frac{1+y^2}{(x+y)(y+z)} = ?$

(a) 0 (b) 1
(c) 2 (d) 3

$x = y = z$

$x^2 + x^2 + x^2 = 1$

$\Rightarrow 3x^2 = 1$

$\Rightarrow x^2 = \frac{1}{3}$

$\frac{1+x^2}{2x \times 2x}$

$= \frac{1+x^2}{4x^2} = \frac{1+\frac{1}{3}}{4 \times \frac{1}{3}} = \frac{\frac{4}{3}}{\frac{4}{3}} = 1$

2. If $x^2 + y^2 + z^2 = xy + yz + zx$ then the value of

$$\frac{3x^4 + 7y^4 + 5z^4}{5x^2y^2 + 7y^2z^2 + 3z^2x^2}$$ is

(a) 2 (b) 1

(c) 0 (d) −1

Check: $x = y = z$

$3x^2 = 3x^2$ ✓

$$\frac{3x^4 + 7x^4 + 5x^4}{5x^4 + 7x^4 + 3x^4} = \frac{15x^4}{15x^4} = 1$$

3. If $a^2 + b^2 + c^2 = ab + bc + ca$ then $\frac{a+c}{b}$ is

(a) 0 (b) 2

(c) 1 (d) −1

Check: $a = b = c$

$3a^2 = 3a^2$

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

4. If $\frac{4x-3}{x} + \frac{4y-3}{y} + \frac{4z-3}{z} = 0$ then $\frac{1}{x}+\frac{1}{y}+\frac{1}{z}$ is

(a) 9 (b) 3

(c) 4 (d) 6

put $x=y=z$

$\Rightarrow \frac{4x-3}{x} + \frac{4x-3}{x} + \frac{4x-3}{x} = 0$

$\Rightarrow \left(\frac{4x-3}{x}\right)\times 3 = 0$

$\Rightarrow 4x-3=0$

$\Rightarrow 4x=3$

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

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

$= \frac{3}{x} = \frac{3\times 4}{3} = 4$

$$\left(\frac{2+a}{a}\right) \times 3 = 4$$

$$\Rightarrow \quad 6+3a = 4a$$

$$\Rightarrow \quad 6 = a$$

$$= \frac{3a^2}{a^3}$$

$$= \frac{3}{6} \frac{1}{2}$$

5. If $\frac{2+a}{a} + \frac{2+b}{b} + \frac{2+c}{c} = 4$ then the value of $\frac{(ab+bc+ca)}{abc}$ is

(a) 2 (b) 1

(c) 0 (d) $\frac{1}{2}$

put a=b=c

6. If $\frac{x+a^2+2c^2}{b+c} + \frac{x+b^2+2a^2}{c+a} + \frac{x+c^2+2b^2}{a+b} = 0$, find x

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

(c) $a^2 + 2b^2 + c^2$ $4a^2$ (d) $-(a^2 + 2b^2 + c^2)$ $-4a^2$

$\left(\frac{x+3a^2}{2a}\right) \times 3 = 0$

$\Rightarrow x+3a^2=0$

$\Rightarrow x=-3a^2$

$a=b=c$

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

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

(c) $a^2-b^2-c^2$ $-a^2$ (d) a^2+b^2 $2a^2$

$\left(\frac{x-a^2}{2a^2}\right)\times 3=\frac{1}{3}$

$\Rightarrow x-a^2=2a^2$

$\Rightarrow x=3a^2$

put a=b=c

8. If $bc + ca + ab = abc$ then

$$\frac{b+c}{bc(a-1)} + \frac{c+a}{ca(b-1)} + \frac{a+b}{ab(c-1)} = ?$$

(a) 0 (b) 1

(c) 2 (d) 3

$3a^2 = a^3$

$a = 3$

$\frac{2a}{a^2(a-1)} \times 3$

$= \frac{2 \times 3}{9 \times 2} 1$

put $a=b=c$

9. If $a^2 = b + c$, $b^2 = c + a$, $c^2 = a + b$, then

$a^2 = 2a$

$a = 2$

$$\left\{\frac{1}{1+a} + \frac{1}{1+b} + \frac{1}{1+c}\right.$$

(a) 0 (b) 1

(c) 2 (d) 3

$$= \left(\frac{1}{1+a}\right) \times 3$$

$$= \frac{1}{3} \times 3$$

2017, 2023 Mains.

put $a=b=c$

10. If a, b, c are non zero, $a+\frac{1}{b}=1$ & $b+\frac{1}{c}=1$ then (i) abc is $a^3=-1$ (ii) $a+\frac{1}{a}$ is $=1$

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

$\Rightarrow a^2+1=a \Rightarrow (a^2-a+1)=0$

$\Rightarrow (a+1)(a^2-a+1)=0$

$\Rightarrow a^3+1^3=0$

$\Rightarrow a^3=-1$

(a) $-1, 1$ (b) $3, -1$

(c) $-3, 1$ (d) $1, 1$

M-1 (Basic)

11. If $a^x = (x + y + z)^y$, $a^y = (x + y + z)^z$ and $a^z = (x + y + z)^x$, then $x + y + z = ?$ $(a \neq 0)$

(a) 0 (b) 1

(c) a^3 (d) a

$a^x = (x+y+z)^y$

$a^y = (x+y+z)^z$

$a^z = (x+y+z)^x$

$a^x \times a^y \times a^z = (x+y+z)^y \times (x+y+z)^z \times (x+y+z)^x$

$\Rightarrow a^{x+y+z} = (x+y+z)^{(x+y+z)}$

$\therefore a = x+y+z$

$a^m = b^m$

$\therefore a = b$

$x=y=z$

11. If $a^x = (x + y + z)^y$, $a^y = (x + y + z)^z$ and $a^z = (x + y + z)^x$; then $x + y + z$ = ? $(a \neq 0)$

(a) 0 (b) 1

(c) a^3 (d) a

$x+y+z \rightarrow 3x$

$a^x = 3x^x$

$\therefore a = 3x$

Special Concept:

$a+b+c=0$

- ~~$1,-1,0$~~
- ~~$2,-1,-1$~~

12. If $a + b + c = 0$, then the value of

$$\frac{a^2+b^2+c^2}{a^2-bc}$$

(a) 0 (b) 1

(c) 2 (d) 3

$a = 1,\ b = -1,\ c = 0$

$$\frac{1+1+0}{1-0} = \frac{2}{1}$$

13. If $a + b + c = 0$ then the value of $\frac{a^2 - bc}{b^2 - ca}$ is :

(a) 0 (b) 1

(c) 2 (d) 3

1 -1 0

$= \frac{(1)^2 - 0}{(-1)^2 - 0} = \frac{1}{1}$

14. If $a + b + c = 0$ then the value of $\frac{a^2 + b^2 + c^2}{ab + bc + ca}$ is

(a) 2 (b) −2

(c) 0 (d) 4

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

CONCEPT OF VALUE PUTTING

$a+b=5$

4 1

3 2

2 3

$a+\cancel{b}=5$

$(+)\ a-\cancel{b}=3$

$\cancel{2}a=\cancel{8}4$

$a=4$

$\therefore\ a+b=5$

$b=5-4=1$

$b=1$

2V 20 ~~0~~

15. If $x + y = 1$, then what is the value of $x^3 + 3xy + y^3$?

SSC CGL MAINS (08/08/2022)

(a) 0
(b) 2
(c) 1
(d) −1

$x + y = 1$

1 , 0

$(1)^3 + 0 + 0$

$= 1$

16. If $a + b = 6$ and $ab = 5$, then what is the value of $a^3 + b^3$?

SSC CGL MAINS (08/08/2022)

(a) 136 (b) 126
(c) 116 (d) 106

$125+1$ 5×1
$= 126$

17. If $a^3 + b^3 = 217$ and $a + b = 7$, then the value of ab is:

SSC CPO 24/11/2020 (Shift- 02)

(a) –6 (b) –1

(c) 7 (d) 6

216 1 6 1

6X1=6

$$x + \frac{1}{x} = 2 \qquad \therefore x = 1$$

$$3 + \frac{3}{3} \quad \cancel{\frac{3}{3}}$$

$$x + \frac{9}{x} = 6 \qquad x = 3$$

$$x + \frac{16}{x} = 8 \qquad x = 4$$

$$x + \frac{25}{x} = 10 \qquad x = 5$$

18. If $r + \frac{64}{r} = 16$, then the value of $r^4 + \frac{1}{r^3}$ is.

SSC CHSL 25/05/2022 (Shift- 03)

(a) $4096\frac{1}{512}$ (b) 512

(c) $512\frac{1}{4096}$ (d) 4096

$r = 8$

$r^4 + \frac{1}{r^3}$

$= 8^4 + \frac{1}{8^3}$

$= 4096 + \frac{1}{512}$

$= 4096\frac{1}{512}$

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

19. If $a - \frac{12}{a} = 1$, $a > 0$, find $a^2 + \frac{16}{a^2}$?

(a) 15 (b) 19

(c) 17 (d) 11

put $a=4$

$4 - \frac{12}{4} = 3$

$= 4 - 3$

$= 1$

$a^2 + \frac{16}{a^2}$

$= 16 + \frac{16}{16} = 1$

$= 17$

20. If $(x+6y) = 8$, and $xy = 2$, where $x > 0$, what is the value of $(x^3 + 216\,y^3)$?

SSC CGL 11/04/2022 (Shift- 01)

(a) 288 (b) 224

(c) 368 (d) 476

2+6 2X1

8+216X1

= 224

21. If $a^2 + b^2 = 65$ and $ab = 8$, $a > b > 0$, then find the value of $a^2 - b^2$.

SSC CGL 21/04/2022 (Shift- 02)

(a) 65 (b) 60

(c) 72 (d) 63

$8^2+1^2=65$

$ab=8$

$8\times1=8$

$\therefore a^2-b^2$

$= 8^2-1^2$

$= 63$

22. If $x^2 + 9y^2 = 40$ and $xy = 4$, where $x > 0$, $y > 0$, then what is the value of $(x^3 + 27y^3)$?

H.W

SSC PHASE IX 2022

(a) 224
(b) 416
(c) 440
(d) 800

$3(-2)$ $27 - 8 = 19$

23. If $xy = -6$ and $x^3 + y^3 = 19$ (x and y are integers), then what is the value of $\frac{1}{x^{-1}} + \frac{1}{y^{-1}}$?

SSC CGL MAINS (08/08/2022)

(a) –2 (b) 2

(c) –1 (d) 1

$x + y$
$= 3 - 2$
$= 1$

24. If If $a^{2} + b^{-1} + c^{-1} = 0$, then

$$\left(\frac{a+b}{c}+\frac{b+c}{a}+\frac{c+a}{b}\right)\left(\frac{a}{b+c}+\frac{b}{c+a}+\frac{c}{a+b}\right)$$ **is :**

SSC CGL 06/06/2019 (Shift- 01)

(a) 8 (b) 9

(c) – 3 (d) 0

$$\left(\frac{2+(-1)}{(-1)}+\frac{(-1)+(-1)}{2}+\frac{(-1)+2}{-1}\right)\left(\quad\right)$$

$$= \left(\frac{-1}{1} \quad \frac{-1}{1} \quad \frac{-1}{1}\right)\left(-\frac{1}{1} \quad -\frac{1}{1} \quad -1\right)$$

$$= (-3)(-3)$$

$$= 9$$

$x+z=y$
$1+1 \quad 2$

25. If $x - y + z = 0$, then find the value of

$$\frac{y^2}{2xz} - \frac{x^2}{2yz} - \frac{z^2}{2xy}.$$

SSC CGL 12/04/2022 (Shift- 03)

$\frac{4}{2\times1\times1} - \frac{1}{2\times2\times1} - \frac{1}{2\times1\times2}$

$= \frac{2}{1} - \frac{1}{4} - \frac{1}{4}$

$= \frac{8-1-1}{4} = \frac{6}{4} = \frac{3}{2}$

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

(c) -6 (d) $-\frac{3}{2}$

26. If $a + b + c = 0$, then what is the value of

$$\frac{(b+c)^2}{bc} + \frac{(c+a)^2}{ca} + \frac{(a+b)^2}{ab}$$?

SSC CGL 18/08/2021 (Shift- 03)

(a) 1 (b) –3

(c) –1 (d) 3

$$\frac{(-2)^2}{1} + \frac{(-1)^2}{-2} + \frac{(1)^2}{(-2)}$$

$$= 4 - \frac{1}{2} - \frac{1}{2}$$

$$= 4 - 1$$

$$= 3$$

verify

27. If a + b − c = 0, then what is the value of

$$\frac{(b-c)^2}{4bc} + \frac{(c-a)^2}{4ca} - \frac{(a+b)^2}{4ab}$$?

a + b = c
1 1 2

$$\frac{(-1)^2}{4\times1\times2} + \frac{(1)^2}{4\times2\times1} - \frac{(2)^2}{4\times1\times1}$$

$$= \frac{1}{8} + \frac{1}{8} - 1$$

$$= \frac{1}{4} - 1$$

$$= -\frac{3}{4}$$

SSC CHSL 06/08/2021 (Shift- 01)

(a) $-\frac{3}{4}$ (b) $\frac{3}{4}$

(c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

28. If $x^{-2} + y^{1} + z^{1} = 0$, then what will be the value of $\left(\frac{x^2}{yz}\right) + \left(\frac{y^2}{zx}\right) + \left(\frac{z^2}{xy}\right)$?

$\frac{4}{1} + \frac{1}{-2} + \frac{1}{-2}$

$= 4 - \frac{1}{2} - \frac{1}{2}$

$= 4 - 1$

$= 3$

SSC CHSL 24/05/2022 (Shift- 01)

$4+1+1=6$

(a) $\frac{3(x^2+y^2+z^2)}{xyz}$ $\quad 3\times(4+1+1)\div -2$

(b) $x^2 + y^2 + z^2$

(c) $\frac{x^2y^2z^2}{x}$ $\quad 4\times1\times1\div -2$

(d) 3

29. If If $a + b + c = 0$, then

$$\left(\frac{a+b}{c}+\frac{b+c}{a}+\frac{c+a}{b}\right)\left(\frac{a}{b+c}+\frac{b}{c+a}+\frac{c}{a+b}\right)$$ is :

SSC CGL 06/06/2019 (Shift- 01)

(a) 8 (b) 9

(c) – 3 (d) 0

30. If $x = \frac{a}{b} + \frac{b}{a}$, $y = \frac{b}{c} + \frac{c}{b}$, $z = \frac{c}{a} + \frac{a}{c}$, then what is the value of $xyz - x^2 - y^2 - z^2 = ?$

(a) –4 (b) –2

(c) –1 (d) –6

If $a=b=c=1$

$\therefore x = 1+1 = 2$

$x=y=z=2$

$8-4-4-4$

$= -4$

a^2

$a^3b = abc$

$a^2 = c$

1 1

31. If $a^3b = abc = 180$, a, b, c are positive integers, then the value of c is :

(a) 110 (b) 1

(c) 4 (d) 25

$abc = 180$

$1 \times b \times 1 = 180$

$b = 180$

put a=1

$\therefore x=2$ $y=1-1=0$

32. If $x = a+\frac{1}{a}$ and $y = a-\frac{1}{a}$ then $\sqrt{x^4+y^4-2x^2y^2}$ is equal to :

x^2
$=4$

SSC CGL 06/06 2019 (Shift- 01)

(a) $16a^2$ 16

(b) 8

(c) $\frac{8}{a^2}$ 8

(d) 4

33. If $x = 2 - p$, then $x^3 + 6xp + p^3$ is equal to :

8

SSC CGL 07/06/2019 (Shift- 01)

(a) 12
(b) 6
(c) 8
(d) 4

33. If $x = 2 - p$, then $x^3 + 6xp + p^3$ is equal to :

SSC CGL 07/06/2019 (Shift- 01)

(a) 12
(b) 6
(c) 8
(d) 4

$x = 2 - p$

$\Rightarrow x + p = 2$

$\Rightarrow (x+p)^3 = (2)^3$

$\Rightarrow x^3 + 3xp(x+p) + p^3 = 8$

$\Rightarrow x^3 + 3xpx2 + p^3 = 8$

$\Rightarrow x^3 + 6xp + p^3 = 8$

34. Find the product of

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

SSC CGL 07/03/2020 (Shift- 03)

(a) $a^3 + b^3 + 8c^3 - 6abc$

(b) $a^3 + b^3 + 6c^3 - 6abc$

(c) $a^3 + b^3 + 8c^3 - 2abc$

(d) $a^3 + b^3 + 8c^3 - abc$

$a^3+b^3+8c^3-3\times a\times b\times 2c$

$= a^3+b^3+8c^3-6abc$

35. If $a + b = 5$ and $ab = 10$, then find the value of $a^2 + b^2$

SSC CGL 18/04/2022 (Shift- 01)

(a) 15 (b) 45

(c) 5 (d) 40

$a+b=5 \qquad ab=10$

$\therefore (a+b)^2 = a^2+b^2+2ab$

$\Rightarrow 25 = K + 20$

$\Rightarrow S = K$

36. If $a + b = 11$ and $ab = 28$, then find the value of $a^3 + b^3$

SSC CGL 19/04/2022 (Shift- 03)

(a) 407 (b) 1639

(c) 2255 (d) 1093

$a+b=11$ $ab=28$ a^3+b^3

$7+4$ 7×4 7^3+4^3

$=343+64$

$=407$

MISCELLANEOUS QUESTIONS

37. If $p = 11$, then the value of $p(p^2 + 3p + 3)$ is:

SSC CHSL 25/05/2022 (Shift- 03)

(a) 1629 (b) 1225

(c) 1727 (d) 1111

$p^3+3p^2+3p+1-1$

$= (p+1)^3 - 1$

$= (12)^3 - 1$

$= 1728 - 1$

$= 1724$

38. If $p = 38$, then the value of $p(p^2 + 3p + 3)$ is _____.

H.W

SSC CHSL 06/06/2022 (Shift- 03)

(a) 39313
(b) 59319
(c) 39318
(d) 59318

39. If $x = 9$, then the value of $x^5 - 10x^4 + 10x^3 - 10x^2 + 10x - 1$ is:

SSC CHSL 30/05/2022 (Shift- 02)

(a) 10 **(b) 8**

(c) 9 **(d) 1**

$$= x^5 - 10x^4 + 10x^3 - 10x^2 + 10x - 1$$

$$= x^5 - 9x^4 - x^4 + 9x^3 + x^3 - 9x^2 - x^2 + 9x + x - 1$$

$$= x^5 - x \cdot x^4 - x^4 + x \cdot x^3 + x^3 - x \cdot x^2 - x^2 + x \cdot x + x - 1$$

$$= x^5 - x^5 - x^4 + x^4 + x^3 - x^3 - x^2 + x^2 + x - 1$$

$$= x - 1$$

$$= 8$$

* $x = 9$ $\quad x^5 - 10x^4 + 10x^3 - 10x^2 + 10x - 1$

$+9x + x - 1 = x - 1 = 8$ ✓

* $x = 12$ $\quad x^6 - 13x^5 + 13x^4 - 13x^3 + 13x^2 - 13x + 5 = -x + 5$

$-12x - x + 5 = -12 + 5 = -7$

* $x = 15$ $\quad x^5 - 16x^4 + 16x^3 - 16x^2 + 20x - 3$

$15x + 5x - 3$

$= 5x - 3$

$= 75 - 3$

$= 72$

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

$243 = 13 \times 21$

40. If $a^4 + b^4 + a^2b^2 = 273$ and $a^2 + b^2 - ab = 21$, then one of the values of $\left(\frac{1}{a}+\frac{1}{b}\right)$ is:

SSC CGL 24/08/2021 (Shift- 01)

$\frac{1}{a}+\frac{1}{b} = \frac{b+a}{ab} = \frac{3}{-4} = -\frac{3}{4}$

(a) $-\frac{9}{4}$ (b) $-\frac{3}{4}$

(c) $\frac{9}{8}$ (d) $\frac{3}{2}$

$a^2+b^2 = \frac{13+21}{2} = 17$

$ab = \frac{13-21}{2} = -4$

$\therefore (a+b)^2 = a^2+b^2+2ab$

$= 17-8$

$= 9$

$(a+b)^2 = 9$

$a+b = 3$

$(x^4+x^2y^2+y^4)=(x^2+xy+y^2)(x^2-xy+y^2)$

41. If $x^4 + y^4 + x^2y^2 = 17\frac{1}{16}$ and $x^2 - xy + y^2 = 5\frac{1}{4}$, then one of the values of $(x - y)$ is:

$\frac{273}{16} = \frac{13}{4} \times \frac{21}{4}$

SSC CGL MAINS 03/02/2022

(a) $\frac{5}{2}$ (b) $\frac{3}{4}$

(c) $\frac{5}{4}$ (d) $\frac{3}{2}$

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

$(x-y)^2 = \left(\frac{\frac{13}{4}+\frac{21}{4}}{2}\right) - 2\left(\frac{\frac{13}{4}-\frac{21}{4}}{2}\right)$

$= \frac{34}{8} - \frac{2\times(-8)}{8} = \frac{34}{8}+\frac{16}{8} = \frac{50}{8}\ \frac{25}{4}$

$\therefore (x-y)^2 = \frac{25}{4}$

$x-y = \frac{5}{2}$

$\frac{13}{4}\ \frac{273}{16} = R \times \frac{21}{4}$

42. If $2^x = 3^y = 6^z$, then $\frac{1}{x} + \frac{1}{y} - \frac{1}{z}$ is equal to:

SSC Phase X 01/08/2022 (Shift- 03)

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

(c) 0 (d) $\frac{-1}{2}$

$2^x = 3^y = 6^z = k$

$2^x = k^1$ | $3^y = k$ | $6^z = k$

$\Rightarrow 2^1 = k^{\frac{1}{x}}$ | $3^1 = k^{\frac{1}{y}}$ | $6^1 = k^{\frac{1}{z}}$

$2 \times 3 = 6$

$\Rightarrow k^{\frac{1}{x}} \times k^{\frac{1}{y}} = k^{\frac{1}{z}}$

$\Rightarrow k^{\frac{1}{x}+\frac{1}{y}} = k^{\frac{1}{z}}$

$\Rightarrow \frac{1}{x} + \frac{1}{y} = \frac{1}{z}$

$\Rightarrow \frac{1}{x} + \frac{1}{y} - \frac{1}{z} = 0$

$a^m \times a^n = a^{m+n}$

$a^m = a^n$

$3^a = 3^{3b} = 3^{4c}$

$a = 3b = 4c$

$a : b : c$
$12 : 4 : 3$

$12\left(\frac{1}{12}+\frac{1}{8}+\frac{1}{15}\right)$

$= 12\left(\frac{20+30+16}{240}\right)$

$= \frac{12 \times 66}{240_{20}} \frac{33}{10} = \frac{33}{10}$

43. If $3^a = 27^b = 81^c$ and $abc = 144$, then the value of $12\left(\frac{1}{a}+\frac{1}{2b}+\frac{1}{5c}\right)$ is :

SSC CGL 06/03/2020 (Shift- 01)

(a) $\frac{17}{120}$

(b) $\frac{18}{10}$

(c) $\frac{18}{120}$

(d) $\frac{33}{10}$

$\therefore 2x+3y+5z$

$= 10+24+10 = 44$

44. If $2^{x+y-2z} = 8^{8z-5-y}$; $5^{4y-6z} = 25^{y+z}$; $3^{4x-3z} = 9^{x+z}$ then the value of $2x + 3y + 5z$ is :

CHSL 13/10/2020 (Shift- 01)

(a) 56 (b) 44

(c) 32 (d) 28

$2^{x+y-2z} = 2^{3(8z-5-y)}$

$x+y-2z = 24z-15-3y$

$x+4y-26z = 15$

$\frac{5}{2}z + 16z - 26z = -15$

$\frac{5}{2}z - 10z = -15$

$-\frac{15}{2}z = -15$ $\therefore z = 2$

$5^{4y-6z} = 5^{2(y+z)}$

$4y-6z = 2y+2z$

$2y = 8z$

$y = 8x2$

$y = 8$

$3^{4x-3z} = 3^{2(x+z)}$

$4x-3z = 2x+2z$

$2x = 5z$

$x = \frac{5}{2}z$

$x = \frac{5}{2}x2$

45. If $5^{\sqrt[3]{x}} + 12^{\sqrt[3]{x}} = 13^{\sqrt[3]{x}}$, then the value of x is :

SSC CHSL 05/07/2019 (Shift- 02)

(a) 2 **(b) 8**

(c) 1 **(d) 4**

$5^{\sqrt[3]{x}} + 12^{\sqrt[3]{x}} = 13^{\sqrt[3]{x}}$

$5^2 + 12^2 = 13^2$

$\sqrt[3]{x} = 2$

$\therefore (x^{\frac{1}{3}})^3 = (2)^3$

$x = 8$

$\equiv$

46. If $6^{\sqrt[4]{x}} + 8^{\sqrt[4]{x}} = 10^{\sqrt[4]{x}}$, then the value of x is :

SSC CHSL 08/07/2019 (Shift- 02)

(a) 2 (b) 16

(c) 4 (d) 8

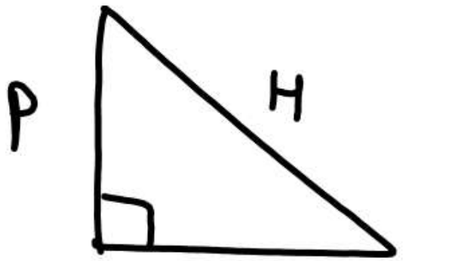
$6^{\sqrt[4]{x}} + 8^{\sqrt[4]{x}} = 10^{\sqrt[4]{x}}$

$6^2 + 8^2 = 10^2$

$\sqrt[4]{x} = 2$

$(x^{\frac{1}{4}})^4 = (2)^4$

$x^1 = 16$



$P^2 + b^2 = H^2$

Special Type

* $\sqrt{8+2\sqrt{15}} = \sqrt{5}+\sqrt{3}$

* $\sqrt{14+2\sqrt{45}} = \sqrt{9}+\sqrt{5} = 3+\sqrt{5}$

* $\sqrt{8-2\sqrt{12}} = \sqrt{6}-\sqrt{2}$

47. If $\sqrt{86-60\sqrt{2}} = a-b\sqrt{2}$, then what will be the value of $\sqrt{a^2+b^2}$, correct to one decimal place?

CGL Tier-II 11/09/2019

(a) 8.4 (b) 8.2

(c) 7.8 (d) 7.2

$\sqrt{86-60\sqrt{2}}$

$= \sqrt{86-2\times30\sqrt{2}}$

$= \sqrt{86-2\sqrt{900\times2}}$

$= \sqrt{86-2\sqrt{1800}}$

$= \sqrt{50}-\sqrt{36}$

$\Rightarrow 5\sqrt{2}-6 = a-b\sqrt{2}$

$5\sqrt{2} = -b\sqrt{2}$ | $a = -6$

$b = -5$

$\sqrt{a^2+b^2} = \sqrt{36+25} = \sqrt{61} = 7.8$

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

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

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

$$= \left(\frac{\sqrt{3}+\sqrt{1}}{2}\right) - \frac{(\sqrt{3}-\sqrt{1})}{2}$$

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

$$= \frac{\cancel{2}}{\cancel{2}}(1)$$

$$= 1$$

48. If $x = \sqrt{1+\frac{\sqrt{3}}{2}} - \sqrt{1-\frac{\sqrt{3}}{2}}$, then the value of $\frac{\sqrt{2}-x}{\sqrt{2}+x}$ will be closest to :

CGL Tier-II 11/09/2019

(a) 0.17 (b) 0.12

(c) 1.4 (d) 1.2

$\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)} \times \frac{(\sqrt{2}-1)}{(\sqrt{2}-1)}$

$= \frac{(\sqrt{2}-1)^2}{(2-1)} = \frac{2+1-2\sqrt{2}}{1}$

$= 3-2\sqrt{2}$

$= 3-2\times1.414$

$= 3-2.818$

$= 0.17$

$\sqrt{2} = 1.414$

$\sqrt{3} = 1.732$

48. If $x = \sqrt{1+\frac{\sqrt{3}}{2}} - \sqrt{1-\frac{\sqrt{3}}{2}}$, then the value of $\frac{\sqrt{2}-x}{\sqrt{2}+x}$ will be closest to :

CGL Tier-II 11/09/2019

(a) 0.17 (b) 0.12

(c) 1.4 (d) 1.2

$\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)}$

$= \frac{1.414-1}{1.414+1} = \frac{0.414}{2.414} = 0.17$

$\sqrt{2} = 1.414$

$\sqrt{3} = 1.732$

$2414)\ 4140(0.17$

2414

17260

-16898

Q. If $x = \sqrt{1+\frac{\sqrt{3}}{2}} - \sqrt{1-\frac{\sqrt{3}}{2}}$, then the value of $\frac{\sqrt{3}-x}{\sqrt{3}+x}$ will be closest to :

CGL Tier-II 11/09/2019

$$\frac{\sqrt{3}-1}{\sqrt{3}+1} = \frac{1.732-1}{1.732+1} = \frac{0.732}{2.732} \approx \frac{183}{683} = 0.27$$

$a=4 \quad b=3 \quad c=1$

49. $ab(a-b)+bc(b-c)+ca(c-a)$ is equal to :

CGL Tier-II 13 09/2019

(a) $(a+b)(b-c)(c-a)$ — $7 \times 2 \times (-3)$

(b) $(a-b)(b+c)(c-a)$ — $1 \times 4 \times (-3)$

(c) $(a-b)(b-c)(c-a)$ — $1 \quad 2$

(d) $(b-a)(b-c)(c-a)$

$(-1)(2)(-3)$

$= 6$

$12 \times 1 + 3 \times 2 + 4(-3)$

$= 6$

50. Let $x = \sqrt[6]{27} - \sqrt{6\frac{3}{4}}$ and $y = \frac{\sqrt{9} + \sqrt{121} + \sqrt{49}}{\sqrt{45} + \sqrt{605} + \sqrt{245}}$, then the value of $x^2 + y^2$ is !

CGL Tier-II 13/09/2019

(a) $\frac{223}{36}$ (b) $\frac{221}{36}$

(c) $\frac{221}{9}$ (d) $\frac{227}{9}$

$x = (3^3)^{\frac{1}{6}} - \left(\frac{27}{4}\right)^{\frac{1}{2}}$

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

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

$y = \frac{3+11+7}{4+5} = \frac{21}{9} = \frac{7}{3}$

$x^2 + y^2$

$= \frac{3}{4} + \frac{49}{9}$

$= \frac{27+196}{36}$

$= \frac{223}{36}$

$\sqrt{x} = x^{1/2}$

$\sqrt[3]{x} = x^{1/3}$

$\sqrt[4]{x} = x^{1/4}$

Concept

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

$$91 = 13 \times 7$$

* $a^2+b^2 = \frac{13+7}{2} = 10$
* $ab = \frac{13-7}{2} = 3$

Concept

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

$$91 = 13 \times 7$$

$$\begin{array}{r} a^2+ab+b^2=13 \\ +\ a^2-ab+b^2=7 \\ \hline 2a^2+2b^2=(13+7) \end{array}$$

$$a^2+b^2=\frac{(13+7)}{2}$$

$$\begin{array}{r} a^2+ab+b^2=13 \\ -\ a^2+ab+b^2=7 \\ \hline 2ab = 13-7 \end{array}$$

$$ab=\frac{13-7}{2}$$

51. If $x^4 + x^2y^2 + y^4 = 21$ and $x^2 + xy + y^2 = 7$, then the value of $\left(\frac{1}{x^2} + \frac{1}{y^2}\right)$ is :

SSC CGL 03/03/2020 (Shift- 02)

(a) $\frac{5}{2}$ (b) $\frac{7}{4}$

(c) $\frac{5}{4}$ (d) $\frac{7}{3}$

$(x^4+x^2y^2+y^4)=(x^2+xy+y^2)(x^2-xy+y^2)$

21 7 x 3

$\frac{1}{x^2}+\frac{1}{y^2} = \frac{y^2+x^2}{(xy)^2}$

$= \frac{5}{(2)^2} = \frac{5}{4}$

$x^2+y^2 = \frac{10}{2} 5$

$xy = \frac{4}{2} 2$

52. If $x^4 + x^2y^2 + y^4 = 273$ and $x^2 - xy + y^2 = 13$, then the value of xy is :

SSC CGL 05/03/2020 (Shift- 02)

(a) 4
(b) 8
(c) 10
(d) 6

$(x^4+x^2y^2+y^4) = (x^2+xy+y^2)(x^2-xy+y^2)$

$273 = 21 \times 13$

$xy = \frac{21-13}{2} = 4$

$4a^2+9b^2 = \frac{7+13}{2} = 10$

$6ab = \frac{7-13}{2} = -3$

$3ab = \frac{-3}{2}$

53. If $16a^4 + 36a^2b^2 + 81b^4 = 91$ and $4a^2 + 9b^2 - 6ab = 13$, then what is the value of $3ab$?

SSC CGL 04/03/2020 (Shift- 01)

(a) -3 **(b) $\frac{3}{2}$**

(c) 5 **(d) $-\frac{3}{2}$**

$(16a^4+36a^2b^2+81b^4) = (4a^2+9b^2+6ab)(4a^2+9b^2-6ab)$

91 = 7 x 13

54. If $\frac{7(x^2+1)-17x}{7x} = 2$, then $\left(\frac{x+1}{\sqrt{x}}\right)^2 = ?$

(a) 6.45 (b) 6.53

(c) 6.86 (d) 6.31

$x + \frac{1}{x} - \frac{17}{7} = 2$

$\Rightarrow x + \frac{1}{x} = 2 + \frac{17}{7}$

$\Rightarrow x + \frac{1}{x} = \frac{31}{7}$

$\frac{x^2+1+2x}{x}$

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

$= \frac{31}{7} + 2$

$= \frac{45}{7} = 6.45$

55. If $\frac{7\left(2\sqrt{2}-x\right)}{x} = 7x + \frac{14}{x^2}$ then

$$\sqrt{\left(23x^{64}+42x^{12}+163\right)}$$

(a) 12 (b) $12\sqrt{2}$

(c) $12\sqrt{3}$ (d) 24

$14\sqrt{2} - 7x = 7x + \frac{14}{x}$

$\Rightarrow 14\sqrt{2} = 14x + \frac{14}{x}$

$\therefore x + \frac{1}{x} = \sqrt{2}$

$\Rightarrow x^2 + \frac{1}{x^2} = 2 - 2 = 0$

$\Rightarrow x^2 + \frac{1}{x^2} = 0$

$\Rightarrow \frac{x^4+1}{x^2} = 0$

$\Rightarrow x^4 + 1 = 0$

$\Rightarrow x^4 = -1$

$\sqrt{23(x^4)^{16} + 42(x^4)^3 + 163}$

$= \sqrt{23(-1)^{16} + 42(-1)^3 + 163}$

$= \sqrt{23 - 42 + 163}$

$= \sqrt{144} = 12$

$k^3 = x^1$

$8x^2 + 15x - 2 = 0$

$\Rightarrow 8x^2 + 16x - x - 2 = 0$

$\Rightarrow 8x(x+2) - 1(x+2) = 0$

$(x+2)(8x-1) = 0$

$x = -2$ or $8x = 1$

$x = \frac{1}{8}$

$\therefore k^3 = \frac{1}{8}$

$\therefore k = \frac{1}{2}$

56. If $8k^6 + 15k^3 - 2 = 0$, then the positive value of $\left(k + \frac{1}{k}\right)$ is:

SSC CGL 12/04/2022 (Shift- 03)

(a) $2\frac{1}{2}$ ✓

(b) $2\frac{1}{8}$

(c) $8\frac{1}{2}$

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

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

57. If $x = \sqrt{1+\frac{\sqrt{3}}{2}} - \sqrt{1-\frac{\sqrt{3}}{2}}$ then the value of $\frac{\sqrt{3}-x}{\sqrt{3}+x}$ (correct to one decimal place) is?

SSC CGL MAINS 29/01/2022

(a) 0.25
(b) 0.17
(c) 0.19
(d) 0.27

58. If (ab + bc + ca) = 0, then what is the value of $\left(\frac{1}{a^2 - bc} + \frac{1}{b^2 - ca} + \frac{1}{c^2 - ab}\right)$?

SSC CHSL 09/06/2022 (Shift- 01)

(a) 2 (b) 0

(c) 1 (d) a + b + c

$ab+ac=-bc$

$ab+bc=-ca$

$bc+ca=-ab$

$$\frac{1}{a^2+ab+ac} + \frac{1}{b^2+ab+bc} + \frac{1}{c^2+bc+ac}$$

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

$$= \frac{1}{a+b+c}\left[\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right] = \frac{1}{a+b+c}\left[\frac{bc+ac+ab}{abc}\right] = 0$$

~~59~~. If $px^3 + x^2 + 3x + q$ is exactly divisible by $(x + 2)$ and $(x - 2)$, then the values of p and q are:

Quadratic

SSC CHSL 08/06/2022 (Shift- 03)

(a) $p = -\frac{3}{4}$ and $q = 4$

(b) $p = \frac{3}{4}$ and $q = 4$

(c) $p = \frac{3}{4}$ and $q = -4$

(d) $p = -\frac{3}{4}$ and $q = -4$

put $x=1$

$4\times9\times\frac{1}{6^2}$

60. What is the value of the following expression?

$$2^2\left(\frac{x^a}{x^b}\right)^{(a+b)}\times3^2\left(\frac{x^b}{x^c}\right)^{(b+c)}\times6^{-2}\left(\frac{x^c}{x^a}\right)^{(a+c)}$$

SSC CHSL 08/06/2022 (Shift- 02)

(a) 1 (b) 0

(c) 4 (d) 9

60. What is the value of the following expression?

$$2^2\left(\frac{x^a}{x^b}\right)^{(a+b)} \times 3^2\left(\frac{x^b}{x^c}\right)^{(b+c)} \times 6^{-2}\left(\frac{x^c}{x^a}\right)^{(a+c)}$$

SSC CHSL 08/06/2022 (Shift- 02)

(a) 1 (b) 0

(c) 4 (d) 9

$4(x^{a-b})^{a+b} \times 9(x^{b-c})^{b+c} \times \frac{1}{6^2}(x^{c-a})^{c+a}$

$= 4(x)^{(a-b)(a+b)} \times 9(x)^{(b-c)(b+c)} \times \frac{1}{36}(x)^{(c-a)(c+a)}$

$= x^{(a^2-b^2)} \times x^{(b^2-c^2)} \times x^{(c^2-a^2)}$

$= x^{a^2-b^2+b^2-c^2+c^2-a^2} = x^0 = 1$

* $x^3+y^3+z^3 = 3xyz$ $\qquad$ $x+y+z=0$

* $(a^2-b^2)^3+(b^2-c^2)^3+(c^2-a^2)^3 \equiv 3(a^2-b^2)(b^2-c^2)(c^2-a^2)$

* $(a^7-b^7)^3+(b^7-c^7)^3+(c^7-a^7)^3 = 3(a^7-b^7)(b^7-c^7)(c^7-a^7)$

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

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

$$(a^6-b^6) = (a^3+b^3)(a^3-b^3)$$

$$(a^8-b^8) = (a^4-b^4)(a^4+b^4)$$

61. **Simplify the following expression.**

$$\frac{5(a^6-b^6)^3+5(b^6-c^6)^3+5(c^6-a^6)^3}{2(a^3-b^3)^3+2(b^3-c^3)^3+2(c^3-a^3)^3}$$

SSC CGL 24/08/2021 (Shift- 02)

$$= \frac{5}{2}\left\{\frac{(a^6-b^6)^3+(b^6-c^6)^3+(c^6-a^6)^3}{(a^3-b^3)^3+(b^3-c^3)^3+(c^3-a^3)^3}\right\}$$

$$= \frac{5}{2}\times\frac{3(a^3-b^3)(a^3+b^3)(b^6-c^6)(c^6-a^6)}{3(a^3-b^3)(b^3-c^3)(c^3-a^3)}$$

$$= \frac{5}{2}(a^3+b^3)(b^3+c^3)(c^3+a^3)$$

(a) $\frac{5}{2}(a^3+b^3)(b^3+c^3)(c^3+a^3)$

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

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

(d) $\frac{5}{2}(a^3-b^3)(b^3-c^3)(c^3+a^3)$

62. If $x^3 + 4x = 8$, find $x^7 + 64x^2$?

(a) 32 (b) 64

(c) 128 (d) 256

$x^3+4x=8$

$\Rightarrow (x^3)^2=(8-4x)^2$

$\Rightarrow x^6=64+16x^2-2\times8\times4x$

$\Rightarrow x^6=64+16x^2-64x$

$\Rightarrow x^7=64x+16x^3-64x^2$

$\Rightarrow x^7+64x^2=16(x^3+4x)$

$\Rightarrow x^7+64x^2=16\times8=128$

63. If $x^2 - 5x + 25 = 0$ then $x^5 - 5x^4 - 3100$?

(a) 25 (b) $25\sqrt{2}$

(c) $25\sqrt{3}$ (d) None

$(x+5)(x^2-5x+25)=0$

$\Rightarrow (x^3+5^3)=0$

$\Rightarrow x^3=-125$

x^5-5x^4-3100

$= x^3(x^2-5x)-3100$

$= (-125)(-25)-3100$

$= +3125-3100$

$= 25$

64. If $(x+5)(x+6)+\frac{9}{x(x-1)}=0$, Find $3x^2+15x-1$?

(a) 4 (b) 6

(c) 8 (d) 10

$$\frac{x(x-1)(x+5)(x+6)+9}{x(x-1)}=0$$

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

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

$\Rightarrow \underbrace{(x^2+5x)}_{t}\underbrace{(x^2+5x-6)}_{t}+9=0$

$\Rightarrow t(t-6)+9=0$

$\Rightarrow t^2-6t+9=0$

$\Rightarrow (t-3)^2=0$

$\Rightarrow t=3$

$t=x^2+5x=3$

$3x^2+15x-1$

$=3(x^2+5x)-1$

$=3\times3-1$

$=8$

Q. $ax+by=p$

$ay-bx=q$

$\Big\}$ $(a^2+b^2)(x^2+y^2)=(p^2+q^2)$

Soln $(ax+by)^2=(p)^2$

$+\ (ay-bx)^2=(q)^2$

$\Rightarrow a^2x^2+b^2y^2+2abxy+a^2y^2+b^2x^2-2abxy=p^2+q^2$

$\Rightarrow a^2(x^2+y^2)+b^2(y^2+x^2)=p^2+q^2$

$\Rightarrow (x^2+y^2)(a^2+b^2)=p^2+q^2$

$ax+by=8$

$ay-bx=6$

$(a^2+b^2)(x^2+y^2)=8^2+6^2=100$

$m \times n = 100$

$m+n=29$

$25 \quad 4$

$\therefore \frac{a^2+b^2}{x^2+y^2}=\frac{m}{n}=\frac{25}{4}$

65. If $ax + by = 8$, $ay - bx = 6$, $a^2 + b^2 + x^2 + y^2 = 29$

Find $\frac{a^2+b^2}{(x^2+y^2)}$; $a^2 + b^2 > x^2 + y^2$?

(a) $\frac{25}{4}$ (b) $\frac{27}{4}$

(c) $\frac{23}{4}$ (d) $\frac{29}{4}$

66. If $3^a = 27^b = 81^c$ and abc = 144, then the value of $12\left(\frac{1}{a}+\frac{1}{2b}+\frac{1}{5c}\right)$ is :

(a) $\frac{33}{10}$ (b) $\frac{18}{10}$

(c) $\frac{17}{120}$ (d) $\frac{18}{120}$

67. If $\frac{a^2+b^2+c^2-1024}{ab-bc-ca} = -2$ and $a+b=5c$, where $c > 0$, then the value of c is _____.

(a) 8 (b) 4

(c) 12 (d) 5

$a^2+b^2+c^2-1024 = -2(ab-bc-ac)$

$\Rightarrow a^2+b^2+c^2+2(ab-bc-ac) = 1024$

$\Rightarrow (a+b-c)^2 = 1024$

$\Rightarrow a+b-c = \pm 32$

$\therefore a+b-c = 32$

$\Rightarrow 4c = 32$

$c = 8$

68. If $a^3 - b^3 = 602$ and $a - b = 2$, then find the value of $(a^2 + b^2)$.

1331-729

11-9

IB ACIO GRADE II 17/01/2024 (Shift-01)

(a) 156 (b) 240

(c) 202 (d) 260

121+81

= 202

68. If $a^3 - b^3 = 602$ and $(a - b)^2 = (2)^2$ then find the value of $(a^2 + b^2)$.

IB ACIO GRADE II 17/01/2024 (Shift-01)

(a) 156 (b) 240

(c) 202 (d) 260

$(a-b)(a^2+b^2+ab) = 602$

$2(a^2+b^2+ab) = 602$

$\Rightarrow 2a^2+2b^2+2ab = 602$

$+ \quad a^2+b^2-2ab = 4$

$3a^2+3b^2 = 606$

$a^2+b^2 = 202$

69. If $x = 7 + 7^{\frac{2}{3}} + 7^{\frac{1}{3}}$, then which of the options below is correct.

IB ACIO GRADE II 17/01/2024 (Shift-02)

(a) $x^3 + 21x^2 - 126x - 252 = 0$

(b) $x^3 + 21x^2 - 126x + 252 = 0$

(c) $x^3 - 21x^2 - 126x + 252 = 0$

(d) $x^3 - 21x^2 + 126x - 252 = 0$

$x - 7 = 7^{\frac{2}{3}} + 7^{\frac{1}{3}}$

$\Rightarrow (x-7)^3 = \left(7^{\frac{2}{3}} + 7^{\frac{1}{3}}\right)^3$

$7^{\frac{2}{3}+\frac{1}{3}} = 7^{\frac{3}{3}} = 7^1$

$\Rightarrow x^3 - 3 \times x \times 7(x-7) - (7)^3 = \left(7^{\frac{2}{3}}\right)^3 + 3 \times 7^{\frac{2}{3}} \times 7^{\frac{1}{3}} \times \left(7^{\frac{2}{3}} + 7^{\frac{1}{3}}\right) + \left(7^{\frac{1}{3}}\right)^3$

$\Rightarrow x^3 - 21x^2 + 147x - 343 = 49 + 3 \times 7^1 (x-7) + 7$

$\Rightarrow x^3 - 21x^2 + 147x - 343 = 49 + 21x - 147 + 7$

$\Rightarrow x^3 - 21x^2 + 126x - 252 = 0$

70. Select the option that is true regarding the following labelled Assertion (A) and Reason (R).

Assertion (A): The value of

$$\frac{\left[(3.9)^3 + 9 \times 1.3 \times 4.29 + 11.7 \times (1.1)^2 + 1.331\right]}{\left[1.23 \times 1.23 + 0.77(0.77 + 0.6 \times 4.1)\right]}$$

is 31.25.

Reason (R): Using $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$ and $(x + y)^2 = x^2 + y^2 + 2xy$

$$\frac{(3.9+1.1)^3}{(1.23+0.77)^2} = \frac{(5)^3}{(2)^2} = \frac{125}{4} = 31.25$$

IB ACIO GRADE II 18/01/2024 (Shift-01)

(a) A is true and R is false.

(b) Both A and R are true but R is not a correct explanation of A.

(c) Both A and R are true and R is a correct explanation of A.

(d) A is false and R is true.