Mission Selection – SSC 2024

ALGEBRAIC IDENTITIES

1. $(a + b)^2 = a^2 + 2ab + b^2 = (-a - b)^2$
2. $(a - b)^2 = a^2 - 2ab + b^2$
3. $(a - b)(a + b) = a^2 - b^2$
4. $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$
5. $(a + b - c)^2 = a^2 + b^2 + c^2 + 2ab - 2bc - 2ca$
6. $(a - b + c)^2 = a^2 + b^2 + c^2 - 2ab - 2bc + 2ca$
7. $(-a + b + c)^2 = a^2 + b^2 + c^2 - 2ab + 2bc - 2ca$
8. $(a - b - c)^2 = a^2 + b^2 + c^2 - 2ab + 2bc - 2ca$
9. $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
10. $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$
11. $a^3 + b^3 = (a + b)^3 - 3ab(a + b)$
    $= (a + b)(a^2 - ab + b^2)$
12. $a^3 - b^3 = (a - b)^3 + 3ab(a - b)$
    $= (a - b)(a^2 + ab + b^2)$
13. $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

if $a + b + c = 0$ then $a^3 + b^3 + c^3 = 3abc$

Mission Selection – SSC 2024

$Q1. X + \frac{1}{X} = 3,\ X^2 + \frac{1}{X^2} = ?$

a.7

b.6

c.9

d.8

$Q2. X + \frac{1}{X} = 4, X^2 + \frac{1}{X^2} = ?$

a.14

b.16

c.32

d.18

$Q3. X + \frac{1}{X} = 3, X^3 + \frac{1}{X^3} = ?$

a. 18

b.27

c.24

d.36

$Q4.\ X^5 + \frac{1}{X^5} = ?,\ \text{if}\ X + \frac{1}{X} = 4$

a. 724

b. 814

c. 742

d. not

Q5.If x + (1 /x) = 3, then the value of $x^5 + \frac{1}{x^5}$ is

(a) 736

(b) 776

(c) 684

(d) not

$Q6. X + \frac{1}{X} = 3,\ X^2 + \frac{1}{X^2} = ?$

a.7

b.6

c.9

d.8

Q7. $X^2 + \frac{1}{X^2} = 34$, if $X + \frac{1}{X} = ?$

a. 4

b.5

c.6

d.2

$Q8.\ X^2 + \frac{1}{X^2} = 47$, if $X + \frac{1}{X}$=?

a. 4

b.5

c.6

d.7

$Q9.\ X^2 + \frac{1}{X^2} = 34,\ X - \frac{1}{X} = ?$

a. $4\sqrt{2}$

b.4

c.8

d.$6\sqrt{2}$

$Q10.\ X^2 + \frac{1}{X^2} = 34,\ X^2 - \frac{1}{X^2} = ?$

a. $24\sqrt{2}$

b.24

c.28

d.$36\sqrt{2}$

$Q11.\ X^4 + \frac{1}{X^4} = 14,\ X^2 + \frac{1}{X^2} = ?$

a. 4

b.16

c.6

d.4

Q12.If $x^{\frac{1}{4}} + \frac{1}{x^{\frac{1}{4}}} = 3, X + \frac{1}{X}$=?

a.87

b.47

c.37

d.27

Q13. $x + y = 4$ and $(1/x) + (1/y) = 16/15$,
then what is the value of $(x^3 + y^3)$?

(a) 18
(b) 19
(c) 21
(d) 16

Q14.If $16x^2 + y^2 = 48$ and $xy = 2$, $x, y > 0$, then the value of $(64x^3 + y^3)$ is

(a)320

(b) 340

(c) 300

(d) 240

Q15.If $2x^2 - 8x - 1 = 0$, then what is the value of $8x^3 - \frac{1}{x^3}$

(a)560

(b) 540

(c) 524

(d) 464

Q16.If $x - y = 4$ and $x^3 - y^3 = 316$, $y > 0$ then the value of x4 – y 4 is :

(a) 2482

(b) 2320

(c) 2500

(d) 2401

$Q16.\ x + \frac{1}{x} = \sqrt{3}\ ,\ x^{6} = ?$

a.-1

b.1

c.2

d.-2

$Q17. x + \frac{1}{X} = 1, x^3 = ?$

a.-1

b.1

c.3

d.0

$Q18.\ x + \frac{1}{X} = -1,\ x^3 = ?$

a.1

b.-1

c.0

d.2

Q19.if $X^2 + \frac{1}{X^2} = 7$, find the value of $x^3 + \frac{1}{X^3}$

a.18

b.28

c.27

d.32

Q20. If $x-\frac{1}{x} = 2$, *find the vlaue of* $x^4 - \frac{1}{X^4}$

a. $24\sqrt{2}$
b. $28\sqrt{2}$
c. $22\sqrt{2}$
d. $2\sqrt{2}$

Q21.If $x^2+\frac{1}{x^2} = 6$, *find the vlaue of* $x^3 - \frac{1}{X^3}$

a. 14

b.16

c.18

d.20

Q22.If $\frac{P}{q} - \frac{q}{p} = 4$, find the value of $\frac{P^3}{q^3} + \frac{q^3}{p^3}$

a. $34\sqrt{5}$

b. $30\sqrt{5}$

c.30

d.24

Q23.If $x=\sqrt{\frac{\sqrt{5}+1}{\sqrt{5}-1}}$ then the value of $5x^2- 5x-1$ will be:

a. **0**
b. 3
c. 4
d. **5**

Q24.If $x+\frac{1}{x}=\sqrt{3}$, then the value of $x^{208}+x^{202}$ will be-

a. 0

b. 1

c. $\sqrt{3}$

d. $-\sqrt{3}$

Q25.If $x=11+6\sqrt{2}$, then find the value of $\sqrt{X}$

a. $2+\sqrt{3}$

b. $3-\sqrt{2}$

c. $1+\sqrt{2}$

d. $2-\sqrt{3}$

Q26.If x=7+$4\sqrt{3}$, then find the value of $\sqrt{X}$

a. $2+\sqrt{3}$

b. $2-\sqrt{3}$

c. 0

d. 1

Q27.If $x=\frac{\sqrt{3}}{2}$, then find the value of $\sqrt{1+x}$.

a. $\frac{\sqrt{3}}{2}+\frac{1}{2}$

b. $\frac{\sqrt{3-1}.}{2}$

c. $2-\sqrt{3}$

d. $2+\sqrt{3}$

Q28.If $x^{\frac{1}{4}} + \frac{1}{x^{\frac{1}{4}}} = 1$, then find the value of $x^{1024} + \frac{1}{x^{1024}}$

a. 0

b. -1

c. 1

d. 2

Q29.If $a^3+ b^3+ c^3- 3abc=0$ and $a + b +c\neq 0$ find relation

a. a=b=c

b. a + b=c

c. a + c=b

d. a=b+c

Q30.If a=997, b=998 and c=999, $a^3+b^3+c^3-3abc$ =?

a. 0

b. 8982

c. 1

d. 4491

If $x=3+2\sqrt{2}$ and $x\ y=1$, then find the value of $\frac{x^3+3xy+y^3}{x^2-2xy+y^2}$

a. $\frac{209}{11}$

b. $\frac{209}{37}$

c. $\frac{205}{37}$

d. $\frac{201}{32}$

If $a + b=5$ and $a^2+ b^2 =13$, then find the value of $a-b$

a. 0

b. -1

c. 2

d. ± 1

If $\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b} = 1$, then find value of $\frac{a^2}{b+c} + \frac{b^2}{c+a} + \frac{c^2}{a+b}$

a. **0**

b. -1

c. **2**

d. **2**

If $x=3^{\frac{1}{3}}+3^{\frac{-1}{3}}$ then find the value of $3x^3-9x$

A -10
B -1
C 1
D 10

If $x=2-2^{\frac{1}{3}}+2^{\frac{2}{3}}$ then find the value of $x^3-6x^2+18x+18$

A 22
B 33
C 40
D 45

$$\frac{1}{\sqrt[3]{4}+\sqrt[3]{2}+1} = a\sqrt[3]{4} + b\sqrt[3]{2} + c$$

a,b,c are rational numbers find a+b+c

A 0

B 1

C 2

D 3

If $x=2+\sqrt{3}$ then find the value of x^2-4x+2.

a. **0**

b. -1

c. **1**

d. **2**

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

a. $x^6+\frac{1}{x^6}$

b. $x^8+\frac{1}{x^8}$

c. $x^8-\frac{1}{x^8}$

d. $x^6-\frac{1}{x^6}$

If a= $\sqrt{7+2\sqrt{12}}$ and b= $\sqrt{7-2\sqrt{12}}$, then (a^3+b^3) is equal to

a. 40
b. 44
c. 48
d. not

If $x=\sqrt[3]{2+\sqrt{3}}$, then the value of $x3+\frac{1}{x3}$ is

a. 8
b. 9
c. 2
d. 4

If $x+\frac{1}{x}=\sqrt{3}$, then the value of $x^{60}+x^{90}$ will be-

a. 0

b. 1

c. $\sqrt{3}$

d. $-\sqrt{3}$

If $x=11+6\sqrt{2}$, then find the value of $\sqrt{X}$

a. $2+\sqrt{3}$

b. $3+\sqrt{2}$

c. $1+\sqrt{2}$

d. $2-\sqrt{3}$

If $x=97+8\sqrt{6}$, then find the value of $\sqrt{X}$

a. $4\sqrt{6}+\sqrt{1}$

b. $\mathbf{4\sqrt{6+1}}$

c. . $4\sqrt{6}-\sqrt{1}$

d.. $4\sqrt{6}+\sqrt{5}$

If $x+\frac{1}{x}=\sqrt{3}$ then find $x^{506}+x^{500}+x^{384}+x^{190}+x^{184}+x^{18}+x^{12}$

a. 3

b. **1**

c. 84

d. *not*

If $x^{\frac{1}{8}} + \frac{1}{x^{\frac{1}{8}}} = 1$, then find the value of $x^{512} + \frac{1}{x^{512}}$

a. 0
b. -1
c. 1
d. 2

If $x^{1/3}+y^{1/3}=z^{1/3}$

Find the value $(x+y-z)^3+27xyz$

a.1

b.0

c. 2

d. -1

If a=25, b=15 and c= -10, $a^3+b^3+ c^3-3abc/(a-b)^2 +(b-c)^2 +(c-a)^2$

a. 15

b. 10

c. 1

d. 0

If $x=5+2\sqrt{6}$ and $x\,y=1$, then find the value of $\frac{x^3+3xy+y^3}{x^2-2xy+y^2}$

a. $\frac{209}{93}$

b. $\frac{973}{97}$

c. $\frac{205}{37}$

d. not

If $x=16$, find the value of $x^4-17x^3+17x^2-17x+17$

a. 0

b. -1

c. 2

d. 1

If $\frac{a}{1-a} + \frac{b}{1-b} + \frac{c}{1-c} = 1$, then find value of $\frac{1}{1-a} + \frac{1}{1-b} + \frac{1}{1-c}$

a. **0**

b. -1

c. 4

d. **2**

If $x^4 + \frac{1}{x^4} = 194$ then find the value of $x^3 - \frac{1}{x^3}$.

a. $30\sqrt{3}$

b. $30\sqrt{2}$

c. 14

d. 25

If $x + \frac{1}{x} = 5$ then find the value of $.x^2 - \frac{1}{x^2}$

a. $5\sqrt{21}$

b. 5

c. $-5\sqrt{21}$

d. 7

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

And xy=1 then find the value of $(\frac{x-y}{x+y})^2$

a. 3/7

b. 3/4

c. 0

d. 1

$x + \frac{1}{x} = 1$ then find the value of $x^{17} + \frac{1}{x^{17}}$

a. 1
b. -1
c. 0
d. *not*

$4^{2x-y} = 4^{x+y} = \sqrt{64}$ find the value of x

a. 1
b. 0
c. 2
d. not

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

a. 13/6
b. 6/13
c. 13
d. not

if a + b+ c =0 then the value of the $a^2 + b^2 + c^2 / c^2 - ab$

a. 2
b. 1
c. a+b+c
d. not

If a + b+ c =0 then the value of the

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

a. 3
b. 1
c. 2
d. not

$a + b + c = 0, (a^3 + b^3 + c^3)^2 = ?$

(1) $3a^2 b^2 c^2$

(2) $9abc$

(3) $27abc$

(4) $9a^2 b^2 c^2$

If $x = \sqrt{3} + \sqrt{4} + \sqrt{5}$ then

$x^4 - 8x^3 + 8x^2 + 32x = ?$

A- 36

B- 39

C-40

D- 54

If $(a^{28} + 1) / a^{14} = 23$

then $(a^{42} + 1) / a^{21} = ?$

A-110

B- 29

C- 52

D- 59

Mission Selection – SSC 2024

If $\{(a^2 + b^2 + c^2) / (a^2 – b^2 – c^2)\} + \{(b^2 + c^2 + a^2) / b^2 – c^2–a^2)\} + \{(c^2 + a^2 +b^2) / (c^2 – a^2 –b^2)\} = ?$

A- 0
B- 1
C-3
D-1

If $x = 1$ / $x = \sqrt{5}$ than $\sqrt{x}(\sqrt{x} - 1) = ?$

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

B- $\frac{\sqrt{5}}{4}$

C – 1

D $-\frac{10}{\sqrt{5}}$

If $x = (1 / \sqrt{5} - 2)$ then

$x^4 + 16x^2 - 8x^3 = ?$

A- -1

B - $\sqrt{5}$

C- $2\sqrt{5}$

D- $\sqrt{5} + 2$

If $x = (1 / \sqrt{5} - 2)$ then

$2x^3 - 5x^2 - 14x - 3 = ?$

A - 0

B -1

C -5

D - 3

If $x + (1 / x) = = 1$ then

$x^{50} + x^{51} + x^{52} + x^{53} + x^{54} + x^{55} = ?$

A – 3
B – 6
C – 2
D - 0

If $x + (1 / x) = 0$ then $x^{12} + x^{14} + x^{16} + x^{18} = ?$

A- 0
B – 1
C – 2
D - 4