1. **Answer: (C)**
$x^4+1/x^4=1442$
Add 2 from both side
$x^4+1/x^4+2=1444$
$x^2+1/x^2=38$
Subtract 2 from both side
$x^2+1/x^2-2=36$
$x-1/x=6$

2. **Answer: (B)**
If $(3x-7)^3 + (3x-8)^3 + (3x+6)^3 = 3(3x-7)$
$(3x-8)(3x+6)$
In these type of question go through option
$x = 1$
$(3-7)^3 + (3-8)^3 + (3+6)^3 = 3(3-7)(3-8)(3+6)$
$540 = 540$
Value for x = 1 satisfied.

3. **Answer: (A)**
$x + 1/x = 10$
Cube both side
$x^3 - 1/x^3 + 3(x - 1/x) = 1000$
$x^3 - 1/x^3 = 970$

4. **Answer: (B)**
$a^3+b^3=[a+b][a^2+b^2-ab]$ _____ (1)
$[a+b]^2 = a^2 + b^2 + 2ab$
$[a+b]^2 = 99 + 2 \times 11$
$a + b = 11$
$a^3+b^3=[a+b][a^2+b^2-ab]$
$a^3 + b^3 = [11][99-11]$
$a^3 + b^3 = 968$

5. **Answer: (C)**
$8[a+b]^3 + [a-b]^3 = [3a+b][Aa^2 + Bab + Cb^2]$
$[2(a+b)]^3 + [a-b]^3 = [3a+b][Aa^2 + Bab + Cb^2] = [3a+b][Aa^2 + Bab + Cb^2]$
$[2a + 2b + a - b][2(a+b)]^2 + [a-b] + (a+b) - (a-b)]$
$= [3a+b][Aa^2 + Bab + Cb^2]$

$[3a+b][4a^2 + 4b^2 + 8ab + a^2 + b^2 - 2ab + 2a^2 - 2b^2] = [3a+b][Aa^2 + Bab + Cb^2]$
$[7a^2 + 3b^2 + 6ab] = [Aa^2 + Bab + Cb^2]$
By comparing
A = 7, B = 6 C = 3
= A + B − C
= 7 + 6 − 3
= 10

6. **Answer: (B)**
$x^2 - 6x + 1 = 0$
Take x common
$x+1/x=6$ _____ (1)
A.T.Q
$= (x^4+1/x^2)/(x^2+1)$
Multiply by x and divide is domination
$(x^3+1/x^3)/(x+1/x)$
From (1)
$x^3+1/x^3 = 198$ ____ (2)
From (2)
= 198/6 = 33

7. **Answer: (D)**
$x + y + z = 3$
S.B.S
$x^2 + y^2 + z^2 + 2(xy + yz + zx) = 9$
$x^2 + y^2 + z^2 - 36 = 9$
$x^2 + y^2 + z^2 = 45$ _____ (1)
$x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$
$x^3 + y^3 + z^3 - 3xyz = 3(45 + 18)$
$x^3 + y^3 + z^3 - 3xyz = 189$

8. **Answer: (D)**
$[2x + 7]^3 + [2x + 8]^3 + [2x + 3]^3 = 3[2x + 7](2x + 8)[2x + 3]$
In these types of questions go through option
Let x = −3
$[2x - 3 + 7]^3 + [2x - 3 + 8]^3 + [2x - 3 + 3]^3 + 3[2x - 3 + 7][2x - 3 + 8][2x - 3 + 3]$
$[1]^3 + [2]^3 + [-3]^3 = 3 \times 1 \times 2 \times (-3)$

$1 + 8 - 27 = -18$
$-18 = -18$
the value of $x = -3$ is satisfied

9. **Answer: (B)**

$x = \sqrt{3} - \sqrt{2} - - - - - (1)$

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

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

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

Cube both side

$x^3 - \frac{1}{x^3} - 3 \times x \times \frac{1}{x}\left[x - \frac{1}{x}\right] = -16\sqrt{2}$

$x^3 \frac{1}{x^3} = -22\sqrt{2}$

10. **Answer: (A)**

We know that

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

$\Rightarrow a + b + c = 0$

So here, $(x + 7)^3 + (2x + 8)^3 + (2x + 3)^3 = 3(x + 7)(2x + 8)(2x + 3)$

$\Rightarrow (x + 7) + (2x + 8) + (2x + 3) = 0$

$\Rightarrow 5x + 18 = 0$

$\Rightarrow x = -18/5 = -3.6$

11. **Answer: (A)**

$x = 2 - \sqrt{3}$

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

Also, $x + 1/x = 4 \Rightarrow x^2 + 1/x^2 = 16 - 2 = 14$

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

$= (-2\sqrt{3})(14+1)$

$= -30\sqrt{3}$

12. **Answer: (D)**

$(2x - 7)^3 + (2x - 8)^3 + (2x - 3)^3 = 3(2x - 7)(2x - 8)(2x - 3)$

In these type of question it is better to go through option.

Let $x = 3$

$(2 \times 3 - 7)^3 + (2 \times 3 - 8)^3 + (2 \times 3 - 3)^3 = 3(2 \times 3 - 7)(2 \times 3 - 8)(2 \times 3 - 3)$

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

$18 = 18$

So, the value of $x = 3$

13. **Answer: (A)**

$x^4 + 1/x^4 = 1442$
add 2 both side
$x^4 + 1/x^4 + 2 = 1442$
$x^2 + 1/x^2 = 38$
add 2 both side
$x^2 + 1/x^2 + 2 = 40$

$\left[x + \frac{1}{x}\right]^2 = 40$

$X + 1/x = 2\sqrt{10}$

14. **Answer: (A)**

$a^3 - b^3 = [a - b][a^2 + b^2 + ab]$ _____ (1)

A.T.Q

$a^2 + b^2 = 135$

subtract 2ab from both side.

$a^2 + b^2 - 2ab = 135 - 2 \times 7$

$[a - b]^2 = 121$

$a - b = 11$

from (1)

$a^3 - b^3 = [a - b][a^2 + b^2 + ab]$

$= 11[135 + 7]$

$= 11 \times 142$

$= 1562$

15. **Answer: (C)**

$x = 2 + \sqrt{3}$

$1/x = 2 - \sqrt{3}$

Then

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

Cube both side

$x^3 - \frac{1}{x^3} - 3 \times x \times \frac{1}{x}\left[x - \frac{1}{x}\right] = 24\sqrt{3}$

$x^3 - \frac{1}{x^3} = 24\sqrt{3} + 3 \times 2\sqrt{3}$

$x^3 - \frac{1}{x^3} = 30\sqrt{3}$

16. **Answer: (D)**

$(x - 7)^3 + (2x + 8)^3 + (2x - 3)^3 = 3(x - 7)(2x + 8)(2x - 3)$

$(x - 7)^3 + (2x + 8)^3 + (2x - 3)^3 - 3(x - 7)(2x + 8)(2x - 3) = 0$

$a + b + c = 0$

$a^3 + b^3 + c^3 - 3abc = 0$

then

$x - 7 + 2x + 8 + 2x - 3 = 0$

$5x = 2$

x = 0.4

17. **Answer: (D)**

$a^3 + b^3 = [a + b][a^2 + b^2 - ab]$

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

$= a^2 + b^2 - ab$

A.T.Q

$1344 = 28[a^2 + b^2 - ab]$

$a^2 + b^2 - ab = 48$

18. **Answer: (C)**

$x^4 + \dfrac{1}{x^4} = 47$

add 2 both side

$x^4 + \dfrac{1}{x^4} + 2 = 49$

Then

$\left[x^2 + \dfrac{1}{x^2}\right] = 7$

Add 2 both side

$x^2 + \dfrac{1}{x^2} + 2 = 9$

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

$x^2 + 1 = 3x$

multiply by 4 both side

$4x^2 + 4 = 12x$ _____ (1)

A.T.Q

$= [2x - 3]^2$

$= 4x^2 + 9 - 12x$

Put the value of 12x from (1)

$= 4x^2 + 9 - 4x^2 - 4$

$= 5$

19. **Answer: (C)**

$x = 2 + \sqrt{5} - - - - - -(1)$

$\dfrac{1}{x} = \sqrt{5} - 2 - - - - - - -(2)$

From (1) and (2)

$x - \dfrac{1}{x} = 2 + \sqrt{5} - \sqrt{5} + 2$

$x - \dfrac{1}{x} = 4$

Cube both side

$x^3 - \dfrac{1}{x^3} - 3 \times x \times \dfrac{1}{x}\left[x - \dfrac{1}{x}\right] = 64$

$x^3 - \dfrac{1}{x^3} = 64 + 3 \times 4 = 76$

20. **Answer: (C)**

$(x - 8)^3 + (2x + 16)^3 + (2x - 13)^3 = 3(x - 8)(2x + 16)(2x - 13)$

$a^3 + b^3 + c^3 - 3abc = 0$

$a + b + c = 0$

$[x - 8]^3 + [2x + 16]^3 + [2x - 13]^3 - 3(x - 8)(2x + 16)(2x - 13) = 0$

A.T.Q

$x - 8 + 2x + 16 + 2x - 13 = 0$

$5x - 5 = 0$

$5x = 5$

$x = 1$