

# CDS 1 2022

  
adda247  
DEFENCE

# 30 Days

**CRASH COURSE**

**MATHS | DAY-2**

**BY GOPAL SHARMA**



# DAILY CLASS AT 10 AM FOR CDS



If  $x = \sqrt{3} + \sqrt{2}$ , then the value of  $\left(x + \frac{1}{x}\right)$  is:

- (a)  $2\sqrt{2}$
- (b)  $2\sqrt{3}$
- (c) 2
- (d) 3

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- youtube → 7pm ] **CISF**



*If  $x = 7 - 4\sqrt{3}$ , then the value of  $\left(x + \frac{1}{x}\right)$  is:*

- (a)  $3\sqrt{3}$
- (b)  $8\sqrt{3}$
- (c)  $14 + 8\sqrt{3}$
- (d) 14

If  $x = (\sqrt{2} + 1)^{\frac{-1}{3}}$ , the value of  $\left(x^3 - \frac{1}{x^3}\right)$  is

- (a) 0
- (b)  $-\sqrt{2}$
- (c)  $-2$
- (d)  $3\sqrt{2}$

*If  $x = \sqrt[3]{(2 + \sqrt{3})}$ , then the value of  $x^3 + \frac{1}{x^3}$  is:*

- (a) 8
- (b) 9
- (c) 2
- (d) 4

If  $x = 1 - \sqrt{2}$ , the value of  $\left(x - \frac{1}{x}\right)^3$  is

- (a) ~~-8~~
- (b) 8
- (c)  $2\sqrt{2}$
- (d) 1

If  $x = \sqrt{5} + 2$ , then the value of  $\frac{2x^2 - 3x - 2}{3x^2 - 4x - 3}$  is equal to

- (a) 0.185
- (b) 0.525
- (c) 0.625 ✓
- (d) 0.785

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

(a)  $\frac{30}{31}$

(b)  $\frac{70}{31}$

(c)  $\frac{35}{31}$

(d)  $\frac{37}{31}$

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

$$x + y = 6$$

$$\frac{(x^2 + y^2) + 3xy}{(x^2 + y^2) - 3xy}$$

$$= \frac{(x+y)^2 - 2xy + 3xy}{(x+y)^2 - 2xy - 3xy}$$

$$= \frac{36 - 2 + 3}{36 - 2 - 3}$$

$$= \frac{37}{31}$$



If  $x = \sqrt{3} + \sqrt{2}$ , then the value of  $\left(x^2 + \frac{1}{x^2}\right)$  is

(a) 4

(b) 6

(c) 9

(d) 10

$$x + \frac{1}{x} = 2 \times \text{Biggest value}$$

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

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

$$= 12 - 2 = 10$$

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

- (a) 36
- (b) 30
- (c) 32
- (d) ~~34~~

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

↓  
6

$$(6)^2 - 2 = 34$$

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If  $x = 2 + \sqrt{3}$ , then  $x^2 + \frac{1}{x^2}$  is equal to

- (a) 10
- (b) 12
- (c) -12
- (d) 14**

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

$$(4)^2 - 2 = 14$$

If  $a = 2 + \sqrt{3}$ , then the value of  $\left(a^2 + \frac{1}{a^2}\right)$  is

- (a) 12
- (b) 14
- (c) 16
- (d) 10



If  $x = 3 + \sqrt{8}$ , then  $x^2 + \frac{1}{x^2}$  is equal to

(a) 38

(b) 36

~~(c) 34~~

(d) 30

$$x + \frac{1}{x} = 2 \times 3 \\ = 6$$

$$(6)^2 - 2 = 34$$

If  $x = \sqrt{3} + \sqrt{2}$ , then the value of  $\left(x^3 + \frac{1}{x^3}\right)$  is

- (a)  $6\sqrt{3}$
- (b)  $12\sqrt{3}$
- (c)  $18\sqrt{3}$
- (d)  $24\sqrt{3}$



*If  $x = \sqrt{3} + \sqrt{2}$ , then the value of  $x^3 - \frac{1}{x^3}$  is:*

**(a)  $14\sqrt{2}$**

**(b)  $14\sqrt{3}$**

**(c)  $22\sqrt{2}$**

**(d)  $10\sqrt{2}$**

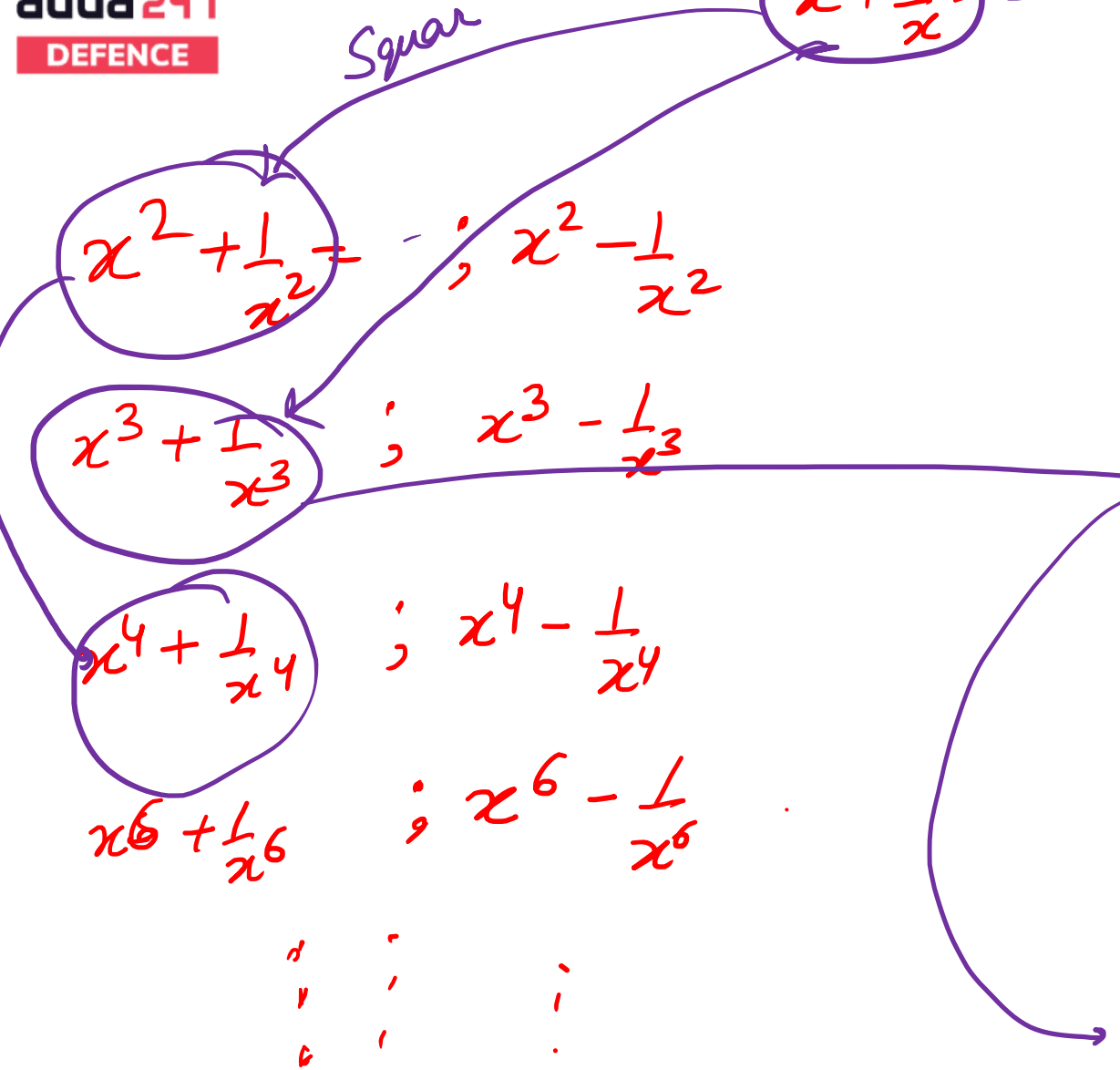
If  $x = 3 + 2\sqrt{2}$ , then  $\frac{(x^6 + x^4 + x^2 + 1)}{x^3}$  is:

- (a) 216
- (b) 192
- (c) 198
- (d) 204



$$x + \frac{1}{x} = 5$$

Square



$$x^8 + \frac{1}{x^8} ; x^8 - \frac{1}{x^8}$$

$$x^9 + \frac{1}{x^9} ; x^9 - \frac{1}{x^9}$$

$$x^{10} + \frac{1}{x^{10}} ; x^{10} - \frac{1}{x^{10}}$$

$$(x^{16})^2$$

$$x^{32} + \frac{1}{x^{32}}$$

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$$x^5 + \frac{1}{x^5} ; x^5 - \frac{1}{x^5}$$

$$x^7 + \frac{1}{x^7} ; x^7 - \frac{1}{x^7}$$

$$x^9 + \frac{1}{x^9} ; x^9 - \frac{1}{x^9}$$

$$x^{11} + \frac{1}{x^{11}} ; x^{11} - \frac{1}{x^{11}}$$

⋮

⋮

Square

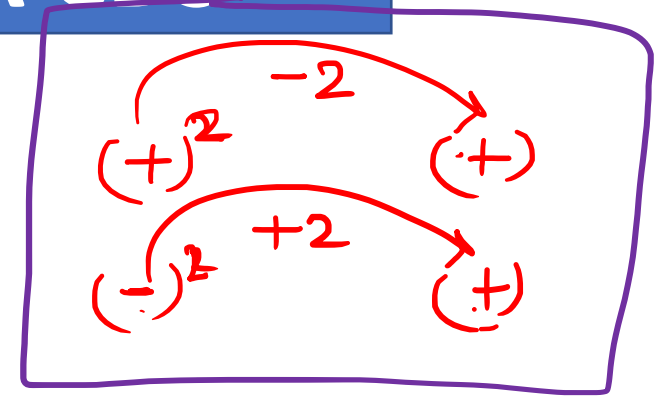
$$x + \frac{1}{x} = \textcircled{V}$$

$$\rightarrow x^2 + \frac{1}{x^2} = (\textcircled{V})^2$$

(+) (-)

$$\begin{matrix} (+4)^2 & -16 \\ (-4)^2 & -16 \end{matrix}$$

$$\begin{matrix} (+)^2 & (-) \times \\ (-)^2 & (-) \times \end{matrix}$$



for Ex  $\rightarrow$

$$x - \frac{1}{x} = 5$$

$$\rightarrow x^2 + \frac{1}{x^2} = (5)^2 + 2$$

$$x + \frac{1}{x} = 5$$

$$\rightarrow x^2 + \frac{1}{x^2} = (5)^2 - 2 = \textcircled{23}$$

$$= \textcircled{27}$$

Ques  $\rightarrow x + \frac{1}{x} = \sqrt{17}$

$\rightarrow x^2 + \frac{1}{x^2} = (\sqrt{17})^2 - 2 = 15$

$\rightarrow x^4 + \frac{1}{x^4} = ? \quad (15)^2 - 2 = 225 - 2 = 223$

Que  $\rightarrow x - \frac{1}{x} = \sqrt{3}$

$x^2 + \frac{1}{x^2} \rightarrow (\sqrt{3})^2 + 2 = 5$

$x^4 + \frac{1}{x^4} \rightarrow (5)^2 - 2 = 23$

$x^8 + \frac{1}{x^8} = (23)^2 - 2 = 529 - 2 = 527$

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ans  $\rightarrow (x^{12.5})^2 + \frac{1}{x^{12.5}} = (16)^2 - 2$  then find  $x^{25} + \frac{1}{x^{25}} = ?$   
 $256 - 2 = 254$

ans  $\rightarrow \frac{x^{42} + 1}{x^{21}} = 7$  find  $\frac{x^{84} + 1}{x^{42}} = ?$

$$x^{21} + \frac{1}{x^{21}} = 7$$

$$x^{42} + \frac{1}{x^{42}} = 47$$

Ques  $\rightarrow$  if  $x^{2019} = (11 - 2\sqrt{30})$  find  $x^{4038} + \frac{1}{x^{4038}} = ?$

$$\frac{1}{x^{2019}} = 11 + 2\sqrt{30}$$

$$x^{2019} + \frac{1}{x^{2019}} \rightarrow 22$$

$$\begin{aligned} & (22)^2 - 2 \\ &= 484 - 2 = \boxed{482} \end{aligned}$$

if  $x = \sqrt{\frac{3+2\sqrt{2}}{3-2\sqrt{2}}}$  then find  $x^8 + \frac{1}{x^8} = ?$

$$(x)^2 = (3+2\sqrt{2})$$

$$x^2 = 3+2\sqrt{2}$$

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

$$x^2 + \frac{1}{x^2} = 6$$

$$x^4 + \frac{1}{x^4} = 34$$

$$(34)^2 - 2 = 1156 - 2 = 1154$$

- (a) 1156
- (b) 1154
- (c) 1152
- (d) 1158



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Que  $\rightarrow \frac{2x}{5x^2 - 7x + 5} = \frac{1}{3}$

find  $\rightarrow x^2 + \frac{1}{x^2} = ?$

$6x = 5x^2 - 7x + 5$

$13x = 5x \left( x + \frac{1}{x} \right)$

$\frac{13}{5} = x + \frac{1}{x}$

$\left( \frac{13}{5} \right)^2 - 2$

$= \frac{169}{25} - 2$

$= \frac{119}{25}$

*[Handwritten flourish]*



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