

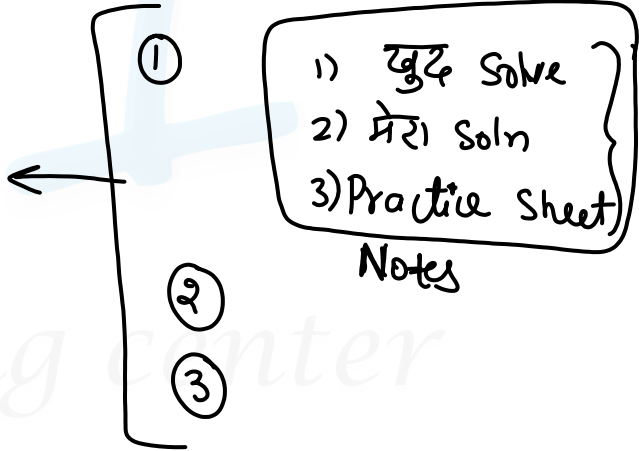
Square identities in 2 variables

$$\surd (a+b)^2$$

$$\surd (a-b)^2$$

$$\surd (a^2-b^2)$$

Mocks
Strategy
Content

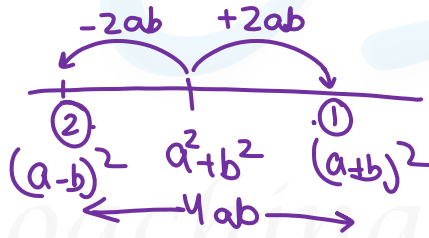


Identities to remember:

$$(a \oplus b)^2 = a^2 + b^2 \oplus 2ab \quad \text{①}$$

$$(a \ominus b)^2 = a^2 + b^2 - 2ab \quad \text{②}$$

$$a^2 - b^2 = (a - b)(a + b) \quad \text{③}$$



$(a-b)^2$ से $(a+b)^2$, $4ab$
बड़ा है

Sum and difference:

$$\frac{\textcircled{1} + \textcircled{2}}{}$$

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

$$\frac{\textcircled{1} - \textcircled{2}}{}$$

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

coaching center

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

$$\boxed{a^2 + b^2 + 2ab}$$

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

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

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

$$\left. \begin{array}{l} +2ab \\ +ab \end{array} \right\} 3ab$$

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

$$a^2 + b^2 + 3ab = (a+b)^2 + ab = (a-b)^2 + 5ab$$

$$a^2 + b^2 - 3ab = (a+b)^2 - 5ab = (a-b)^2 - ab$$

$$a^2 + b^2 - 7ab = (a+b)^2 - 9ab = (a-b)^2 - 5ab$$

$$\left. \begin{array}{l} -2ab \\ -7ab \end{array} \right\}$$

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

$$\downarrow$$
$$a^2 + b^2 + 2ab$$

$$(a+b)^2 = \boxed{a^2 + b^2} + 2ab$$

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

1. If $a + b = 12$, $ab = 22$, then $(a^2 + b^2)$ is equal to

अगर $a + b = 12$, $ab = 22$, तो $(a^2 + b^2)$:

a) 188

b) 144

c) 34

d) 100 ✓

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

$$\begin{array}{r} 144 \\ - 44 \\ \hline 100 \end{array}$$

coaching center

2. If $p + q = \underline{10}$ and $pq = 5$, then the numerical value of $\frac{p}{q} + \frac{q}{p}$ will be

अगर $p + q = 10$ और $pq = 5$, तो $\frac{p}{q} + \frac{q}{p}$ का मान:

100
-10

a) 16

b) 20

c) 22

~~d) 18~~

$$\frac{18}{5} = \frac{(p+q)^2 - 2pq}{pq} = \frac{p^2 + q^2}{pq}$$

$$\frac{3}{5} + \frac{7}{2} = \frac{6 + 35}{10}$$

$$\frac{7}{5} - \frac{3}{2} = \frac{14 - 15}{10}$$

coaching center

3. If $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ & $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ then value of $x^2 + y^2$ is :

अगर $x = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ और $y = \frac{\sqrt{3}-1}{\sqrt{3}+1}$ है, तो $x^2 + y^2$:
~~a) 14~~ a-b b) 13 a+b c) 15 d) 10

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

$x+y = \frac{2(3+1)}{3-1} = 4$

$xy = 1$

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

$\sqrt{x} \times \frac{1}{\sqrt{x}} = 1$ $xy = 1$

$= (x+y)^2 - 2xy = 16 - 2 = 14$
 $= (x-y)^2 + 2xy = 12 + 2 = 14$

$\sqrt{x} \times \frac{1}{\sqrt{x}} = 1$

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

यदि $a = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ तथा $b = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$ है तो $a^2 + b^2 - ab$ का मान क्या है?

a) 97

b) $2\sqrt{3} + 2$

c) $4\sqrt{6} + 1$

d) 98

$$a+b = \frac{2(3+2)}{3-2} = 10$$

$$ab = 1$$

$$a-b = \frac{4\sqrt{3}\sqrt{2}}{3-2} = 4\sqrt{6}$$

$$ab = 1$$

$$(a+b)^2 - 3ab = 100 - 3 = 97$$

$$(a-b)^2 + ab = 96 + 1 = 97$$

5. If $a = \frac{\sqrt{5}+1}{\sqrt{5}-1}$ & $b = \frac{\sqrt{5}-1}{\sqrt{5}+1}$, then the value of $\frac{a^2+ab+b^2}{a^2-ab+b^2}$ is

अगर $a = \frac{\sqrt{5}+1}{\sqrt{5}-1}$ & $b = \frac{\sqrt{5}-1}{\sqrt{5}+1}$, तो $\frac{a^2+ab+b^2}{a^2-ab+b^2}$ का मान:

a) $\frac{3}{4}$

b) $\frac{4}{3}$

c) $\frac{3}{5}$

d) $\frac{5}{3}$

$$a+b = \frac{2(5+1)}{5-1} = 3$$

$$ab = 1$$

$$\frac{(a+b)^2 - ab}{(a+b)^2 - 3ab} = \frac{9-1}{9-3} = \frac{8}{6} = \frac{4}{3}$$

coaching center

$$\frac{1}{\textcircled{3+2\sqrt{2}}} = \frac{3-2\sqrt{2}}{9-8} = 3-2\sqrt{2}$$

$$\frac{1}{3+\sqrt{2}} = \frac{3-\sqrt{2}}{9-2} = \frac{3-\sqrt{2}}{7}$$

$$\frac{2}{\textcircled{2\sqrt{3}}-\sqrt{5}} = \frac{2(2\sqrt{3}+\sqrt{5})}{\cancel{12}-57}$$

coaching center

6. 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

अगर $x = 3 + 2\sqrt{2}$ और $xy = 1$ तो $\frac{x^2+3xy+y^2}{x^2-3xy+y^2}$:

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

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

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

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

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

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

$$y = \frac{1}{x} = \frac{1}{3+2\sqrt{2}} = \frac{3-2\sqrt{2}}{9-8}$$

$$x+y = 6$$

$$xy = 1$$

$$\frac{(x+y)^2 + xy}{(x+y)^2 - 5xy} = \frac{36+1}{36-5} = \frac{37}{31}$$

$$\left. \begin{array}{l} -2xy \\ -3xy \end{array} \right\}$$

coaching center

$b = \frac{1}{a} = \frac{1}{\sqrt{8}-\sqrt{7}} = \sqrt{8}+\sqrt{7}$

7. If $a = \sqrt{8} - \sqrt{7}$ and $a = \frac{1}{b}$, then $\frac{a^2+b^2-3ab}{a^2+ab+b^2}$ is equal

HW

अगर $a = \sqrt{8} - \sqrt{7}$ और $a = \frac{1}{b}$, तो $\frac{a^2+b^2-3ab}{a^2+ab+b^2}$ बराबर

हैं: $b = \sqrt{8} + \sqrt{7}$

$$\left. \begin{aligned} a+b &= 2\sqrt{8} \\ ab &= 1 \end{aligned} \right\}$$

- a) $\frac{27}{31}$
- c) $\frac{29}{33}$

- b) $\frac{27}{32}$
- d) $\frac{29}{31}$

$$\frac{(a+b)^2 - 5ab}{(a+b)^2 - ab} = \frac{32 - 5}{32 - 1} = \frac{27}{31}$$

coaching center

8. If $x = \sqrt{10} + \sqrt{11}$, $y = \sqrt{10} - \sqrt{11}$, then value of $7x^2 - 50xy + 7y^2 = \underline{\hspace{2cm}}$.

यदि $x = \sqrt{10} + \sqrt{11}$, $y = \sqrt{10} - \sqrt{11}$, तो $7x^2 - 50xy + 7y^2$ का मान ज्ञात कीजिए।

a) 386

b) 1360

c) 344

d) 704

$$7(x^2 + y^2) - 50xy$$

$$(x+y)^2 - 2xy = 42$$

\downarrow \downarrow
 $2\sqrt{10}$ -1

$$7 \times 42 - 50 \times -1$$

$$= \begin{array}{r} 294 \\ +50 \\ \hline 344 \end{array}$$

$$7(x^2 + y^2) - 50xy$$

\downarrow \downarrow
 $2(10+11) = 42$ (-1)

$$= 294 + 50 = 344$$

9. Simplify $(957 + 932)^2 - 4 \times 957 \times 932$.

$(957 + 932)^2 - 4 \times 957 \times 932$ को सरल करें।

~~a) 625~~

b) 676

c) 529

d) 576

~~a~~ b

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

$$= (25)^2 = 625$$

coaching center

10. If $x = \frac{1}{2+\sqrt{3}}$, $y = \frac{1}{2-\sqrt{3}}$, then the value of $8xy(x^2 + y^2)$ is

अगर $x = \frac{1}{2+\sqrt{3}}$, $y = \frac{1}{2-\sqrt{3}}$, तो $8xy(x^2 + y^2)$ का मान:

a) 112

b) 194

c) 290

d) 196

$$x = \frac{2-\sqrt{3}}{4-3} = \frac{2-\sqrt{3}}{1}$$

$$y = \frac{2+\sqrt{3}}{4-3} = \frac{2+\sqrt{3}}{1}$$

$$8 \times 1 \times 2 (4+3) = 112$$

coaching center

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

$$(a+b)^2 - (a-b)^2 = 4ab \times \frac{2(a^2 + b^2)}{8ab(a^2 + b^2)}$$

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

11. If $a + b = \sqrt{7}$ and $a - b = \sqrt{5}$, then find the value of $8ab(a^2 + b^2) - (a - b)^2$.

यदि $a + b = \sqrt{7}$ और $a - b = \sqrt{5}$ है, तो $8ab(a^2 + b^2) - (a - b)^2$ का मान ज्ञात कीजिए।

a) 19
c) 21

b) 23
d) 27

$$4ab \times \frac{2(a^2 + b^2)}{8ab(a^2 + b^2)} - (a - b)^2$$

$$= 2 \times 12 - 5$$

$$= 19$$

coaching center

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

$$\frac{4 \times 3 \times \cancel{\sqrt{y}} \times 2 \times \cancel{\sqrt{x}}}{9x^2y - 4y^2x} = \sqrt{x} \sqrt{y}$$

$$xy(9x - 4y)$$

$$24 = 9x - 4y$$

coaching center

12. If the value of $\frac{3x\sqrt{y}+2y\sqrt{x}}{3x\sqrt{y}-2y\sqrt{x}} - \frac{3x\sqrt{y}-2y\sqrt{x}}{3x\sqrt{y}+2y\sqrt{x}}$ is same as that of $\sqrt{x} \sqrt{y}$, then which of the following relations between x and y is correct?

यदि $\frac{3x\sqrt{y}+2y\sqrt{x}}{3x\sqrt{y}-2y\sqrt{x}} - \frac{3x\sqrt{y}-2y\sqrt{x}}{3x\sqrt{y}+2y\sqrt{x}} = \sqrt{x} \sqrt{y}$ का मान $\sqrt{x} \sqrt{y}$ के समान है, तो x और y के बीच निम्नलिखित में से कौन सा संबंध सही है?

- a) $9x - 4y = 36$ b) $9x + 4y = 24$
 c) $9x + 4y = 36$ d) $9x - 4y = 24$

13. If $\frac{x+\sqrt{x^2-1}}{x-\sqrt{x^2-1}} + \frac{x-\sqrt{x^2-1}}{x+\sqrt{x^2-1}} = 34$, then the value of x is $(x < 0)$

यदि $\frac{x+\sqrt{x^2-1}}{x-\sqrt{x^2-1}} + \frac{x-\sqrt{x^2-1}}{x+\sqrt{x^2-1}} = 34$ है, तो x का मान ज्ञात करो $(x < 0)$

- a) -1 b) -2 c) -3 d) -4

a

b

$$\frac{\cancel{2}(x^2 + x^2 - 1)}{x^2 - \cancel{(x^2 + 1)}} = \cancel{34} / 17$$

$$\cancel{2}x^2 = 18$$
$$x = \pm 3$$

coaching center

14. If $x^2 - y^2 = 80$ and $x - y = 8$, then the average of x and y is

अगर $x^2 - y^2 = 80$ और $x - y = 8$ तो x और y का औसत:

a) 2

b) 3

c) 4

d) 5

$$(x+y) \frac{(x-y)}{8} = \frac{80}{10}$$

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

coaching center

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

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

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

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

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

$$a^3 - b^3 = (a^{3/2} + b^{3/2})(a^{3/2} - b^{3/2})$$

$$(a^2 - b^3)(a^2 + b^3) \\ = a^4 - b^6$$

15. $(x^3 + y^6)(x^3 - y^6)$ is equal to

a $(x^3 + y^6)(x^3 - y^6)$ समान है:

a) $(x^6 - y^{12})$

b) $(x^9 - y^{16})$

c) $(x^6 + y^{12})$

d) $(x^9 + y^{36})$

$$x^6 - y^{12}$$

coaching center

16. If a and b be positive integers such that $a^2 - b^2 = 19$, then the value of $a^2 - b^2$ is

अगर a और b धनात्मक पूर्णांक इस प्रकार हैं की $a^2 - b^2 = 19$ तो $a^2 - b^2$ का मान:

a) 19

b) 91

c) 89

d) 10

$100 - 9 = 91$

$$(a+b)(a-b) = 19$$

↓ ↓ ↙ ↘
19 1 19 × 1

If $a, b > 0$

$$a+b > a-b$$

$$\begin{array}{r} a+b=19 \\ 10 \quad 9 \\ a-b=1 \\ \hline \text{Sum} \\ 2 \end{array}$$
$$\begin{array}{r} \text{diff} \\ 2 \end{array}$$

$$\begin{array}{r}
 (x+y+z)(x+y-z) = 8 \\
 + (x+y+z)(y+z-x) = +10 \\
 + (x+y+z)(x+z-y) = +7 \\
 \hline
 (x+y+z)(x+y+z) = 25
 \end{array}$$

$$(x+y+z)^2 = 25$$

$$x+y+z = \pm 5$$

17. Given that x, y, z are **positive** real numbers, if $(x+y)^2 - z^2 = 8$, $(y+z)^2 - x^2 = 10$ and $(x+z)^2 - y^2 = 7$, then $(x+y+z)$ is equal to:

दिया गया है कि x, y, z धनात्मक वास्तविक संख्याएँ हैं, यदि $(x+y)^2 - z^2 = 8$, $(y+z)^2 - x^2 = 10$ और $(x+z)^2 - y^2 = 7$, फिर $(x+y+z)$ बराबर है:

✓ a) 5

b) 7

c) 8

d) 6

18. If $(x + y)^2 = 21 + z^2$, $(y + z)^2 = 32 + x^2$ and $(z + x)^2 = 28 + y^2$, find $x + y + z = ?$

यदि $(x + y)^2 = 21 + z^2$, $(y + z)^2 = 32 + x^2$ और $(z + x)^2 = 28 + y^2$ है, तो $x + y + z$ का मान ज्ञात करो।

a) 7

b) 8

c) 9

d) 10

$$\frac{(x+y)^2}{a} - \frac{z^2}{b} = 21$$

$$(x+y+z)(x+y-z) = 21$$

$$+(x+y+z)(y+z-x) = 32$$

$$+(x+y+z)(z+x-y) = 28$$

$$(x+y+z)^2 = 81$$

$$x+y+z = \pm 9$$