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ARJUN BATCH

CLASS 9th MATHS

बहुपद

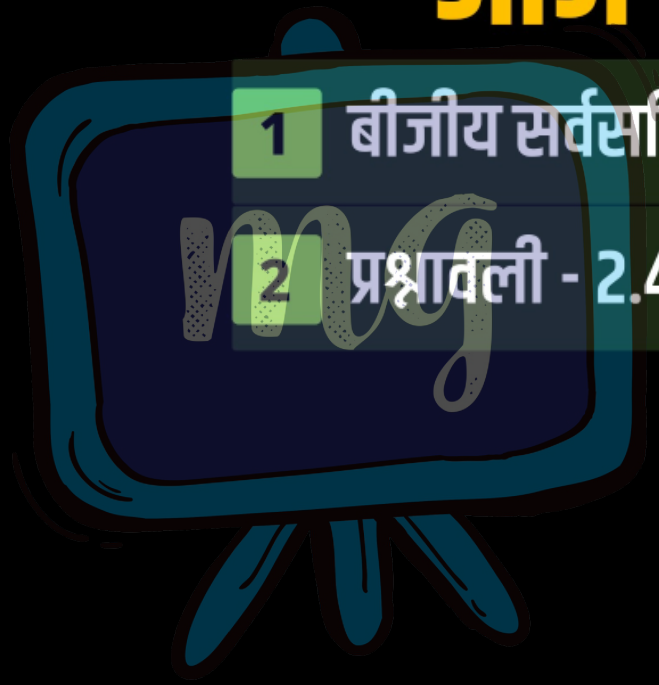
Chapter-2 | Part-7



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आज क्या पढेंगे ?



1. बीजीय सर्वसमिकाएँ
2. प्रश्नावली - 2.4

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बीजीय सर्वसमिकाएँ

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

$x^2+2xy+y^2$

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

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

$(x+y)^3 = x^3+3x^2y+3xy^2+y^3$

$(x-y)^3 = x^3-3x^2y+3xy^2-y^3$

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$$(x+y+z)^2 = x^2+y^2+z^2+2(xy+yz+zx)$$

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

Exa.

$$(x+2)(x+3) = x^2+x(2+3)+2\times3$$

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

$$(x-3)(x+4) = x^2+x(-3+4)+(-3\times4)$$

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

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$(7y+1)(7y-1) = 49y^2 - 1$

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

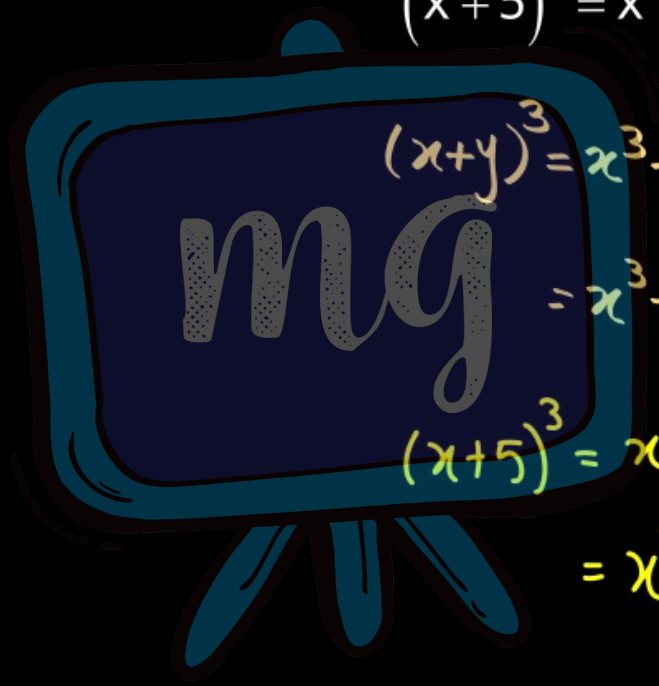
$= (7y)^2 - (1)^2$

$= 49y^2 - 1$

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$$(x+5)^3 = x^3 + 125 + 15x^2 + 75x$$



$$(x+y)^3 = x^3 + y^3 + 3x^2y + 3xy^2$$

$$= x^3 + 3x^2y + 3xy^2 + y^3$$

$$(x+5)^3 = x^3 + 5^3 + 3 \cdot x^2 \cdot 5 + 3 \cdot x \cdot 5^2$$

$$= x^3 + 125 + 15x^2 + 75x$$

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H.W.

$(3y-2)^3 = ___ - ___ y^2 - ___ - 8$



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प्रश्नावली - 2.4

1. उपयुक्त सर्वसमिकाओं का प्रयोग करके निम्नलिखित गुणनफल ज्ञात कीजिए:

(i) $(x + 4)(x + 10)$

हल :- $(x+a)(x+b) = x^2+x(a+b)+ab$

$(x+4)(x+10) = x^2+x(4+10)+4\times10$

$= x^2+14x+40$

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प्रश्नावली - 2.4

(ii) $(x + 8)(x - 10)$

हल :- $(x+a)(x+b) = x^2 + x(a+b) + ab$

$a = 8, \; b = -10$

$(x+8)(x-10) = x^2 + x[8 + (-10)] + 8(-10)$

$= x^2 + (-2)x - 80$

$(x+8)(x-10) = x^2 - 2x - 80$

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प्रश्नावली - 2.4

(iii) $(3x + 4)(3x - 5)$

हल :- $(3x+4)(3x-5)$

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

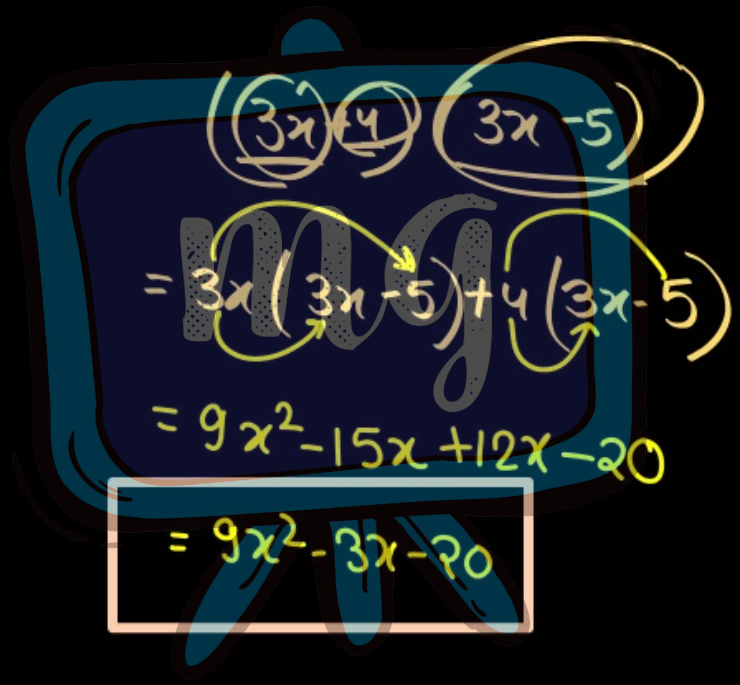
$(3x+4)(3x-5) = (3x)^2 + 3x[4+(-5)] + 4(-5)$

$= 9x^2 + 3x(-1) - 20$

$= 9x^2 - 3x - 20$

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प्रश्नावली - 2.4

(iv) $\left(y^2+\frac{3}{2}\right)\left(y^2-\frac{3}{2}\right)$

$(I+II)(I-II)$

हल :-

$= I^2 - II^2$

$= (y^2)^2 - \left(\frac{3}{2}\right)^2$

$= y^4 - \frac{9}{4}$

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प्रश्नावली - 2.4

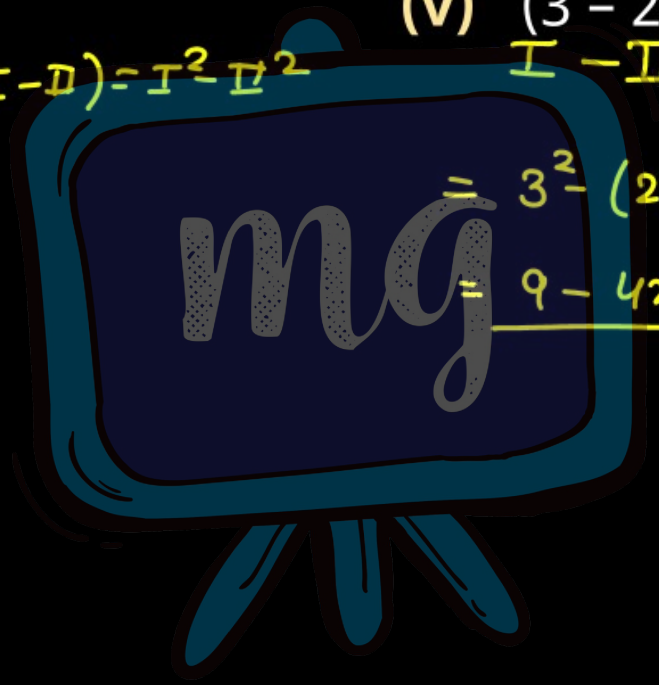
(v) $(3 - 2x)(3 + 2x)$

$(I+II)(I-II) = I^2 - II^2$

$I - II \quad I + II$

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

$= 9 - 4x^2$



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प्रश्नावली - 2.4

2. सीधे गुणा किए बिना निम्नलिखित गुणनफलों के मान ज्ञात कीजिए:

(i) 103×107

103 x 107

M-I

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

103×107

$(100+3) \times (100+7)$

$= (100)^2 + 100(3+7) + 3 \times 7$

$= 10,000 + 1000 + 21$

$= 11021$

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M-2

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

103×107

$= (105-2)(105+2)$

$= (105)^2 - (2)^2$

$= 11025 - 4$

$= 11021$

$(35)^2 = 1225$

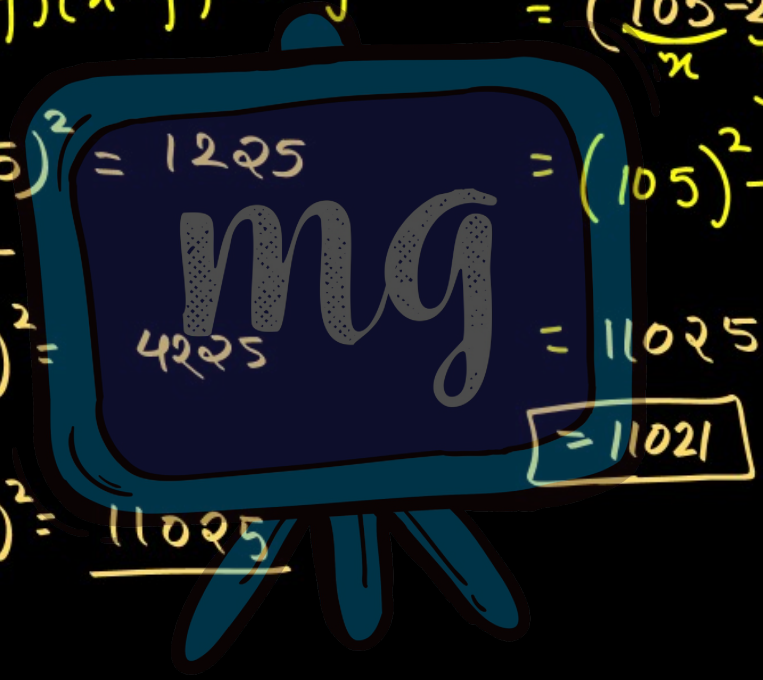
$\frac{35}{4}$

$(65)^2 = 4225$

$\frac{65}{7}$

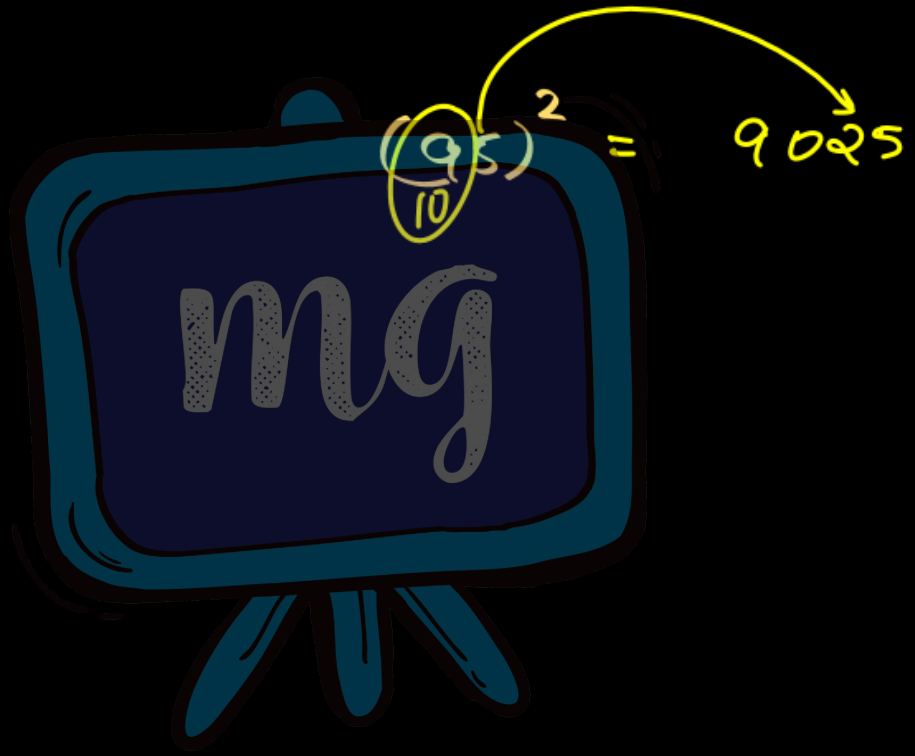
$(105)^2 = 11025$

$\frac{105}{11}$



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प्रश्नावली - 2.4

H.W.

(ii) 95×96

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

$(90+5)(90+6)$

हल :- 95×96

$(100-5)(100-4)$
$x \quad a \quad x \quad b$

$= (100)^2 + 100(-5-4) + (-4 \times -5)$

$= 10,000 + 100(-9) + 20$

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प्रश्नावली - 2.4

(iii) 104×96

हल :- 104×96

$= (100+4)(100-4)$

$(x+y)(x-y)$

$= x^2 - y^2$

$= (100)^2 - (4)^2$

$= 10,000 - 16$

$= 9984$

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प्रश्नावली - 2.4

3. उपयुक्त सर्वसमिकाएँ प्रयोग करके निम्नलिखित का गुणनखंडन कीजिए:

(i) $9x^2 + 6xy + y^2$

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

$(3x)^2 = 9x^2$

हल :- $9x^2 + 6xy + y^2$

$= (3x+y)^2$

$= (3x+y)(3x+y)$

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प्रश्नावली - 2.4

(ii) $4y^2 - 4y + 1$

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

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

$a^2 = 4y^2$

$a = \sqrt{4y^2}$

$a = 2y$

$1^2 = 1$

$b^2 = 1$

$b = 1$

हल :-

$4y^2 - 4y + 1$

$= (2y-1)^2$

$= (2y-1)(2y-1)$

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प्रश्नावली - 2.4

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

(iii) $x^2 - \frac{y^2}{100}$

$a^2 = x^2$

$a = x$

$b^2 = \frac{y^2}{100}$

$b = \sqrt{\frac{y^2}{100}} = \frac{y}{10}$

हल :-

$\left(x + \frac{y}{10}\right)\left(x - \frac{y}{10}\right)$

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(1) Same formulas यात

(2) H.W.

(i) 105×95 (ii) 99×101

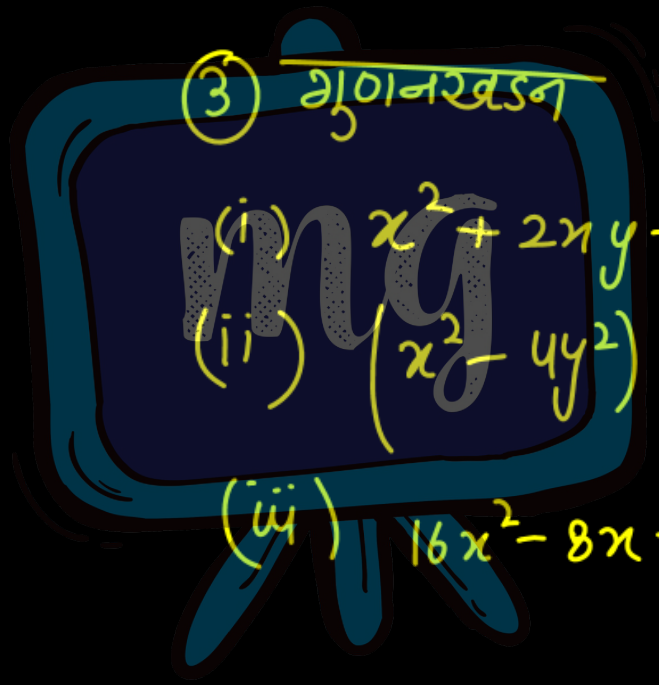
(iii) 101×103 (iv) 77×83

(v) $(x-7)(x+3)$ (vi) $(2y^2+1)(2y^2-1)$

(vii) $(x^3-y^2)^2$ (viii) $(3y^2+1)^2$

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(3) ગુણાનખડન

(i) $x^2 + 2xy + y^2$

(ii) $(x^2 - 4y^2)$

(iii) $16x^2 - 8x + 1$