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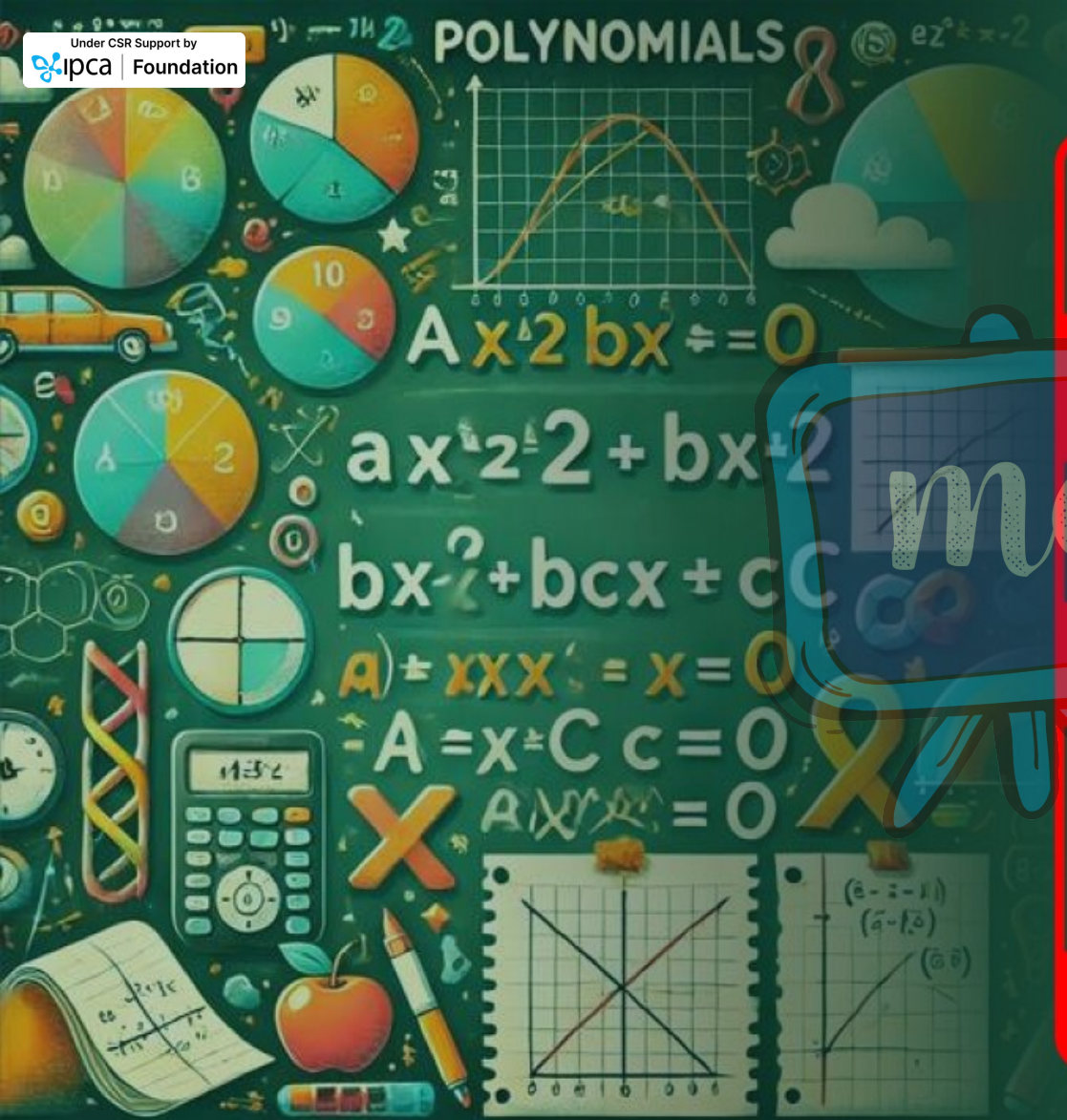

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कक्षा – 9

गणित

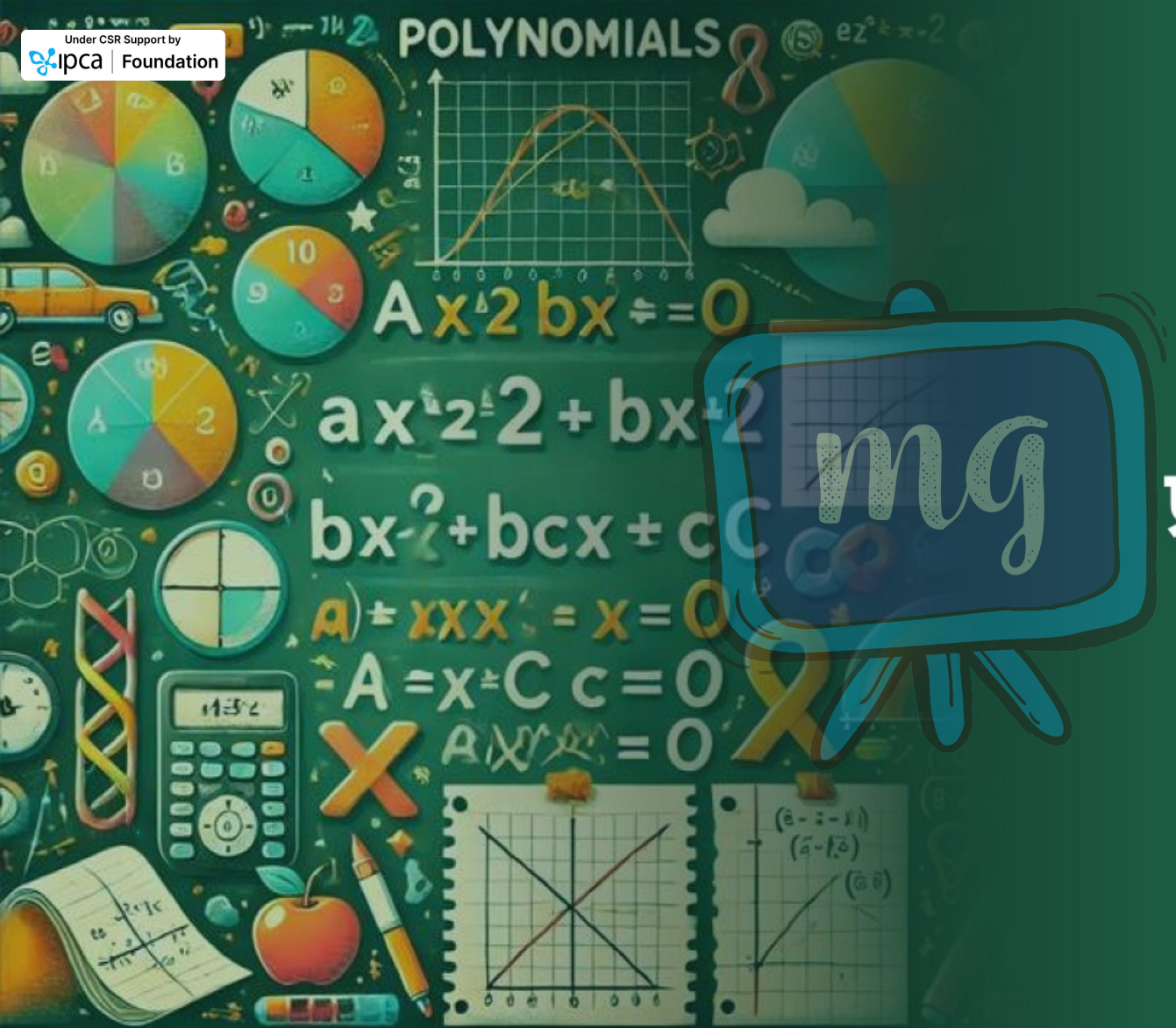
अध्याय – 2

बहुपद

भाग – 7

प्रश्नावली 2.3 (प्रश्न 4)

हर्ष गोयल



प्रश्नावली 2.3

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4. गुणनखंड ज्ञात कीजिए :

(i) $12x^2 - 7x + 1$

माना $p(x) = 12x^2 - 7x + 1$

-7

pq = x^2 का गुणांक × अचर पद

$p(x)$ का मध्य पद = $-7x$

मध्य पद विभक्त करके

ऐसी दो संख्याएँ p व q विद्यमान है

$p + q = -7$

$pq = 12$

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12

12 के गुणनखंड $\pm 1, \pm 2, \pm 3, \pm 6$ —

$\times \quad 1 \times 6 \neq 12$

$\cancel{-2} \times -6$

$\cancel{2 \times 6}$

$3 \times \cancel{4 = 12}$

$3 + 4 = 7$

$-3 \times -4 = 12$

$-3 - 4 = -7$

मध्य पद

$-7x = -3x - 4x$

$p(x) = 12x^2 - 7x + 1$

$= 12x^2 - 3x - 4x + 1$

$= 3x(4x-1) - 1(4x-1)$

$= (4x-1)(3x-1)$

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$$p(x) = 12x^2 - 7x + 1$$

$$12x^2 - 7x + 1 = (4x - 1)(3x - 1)$$



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(ii) $2x^2 + 7x + 3$

माना $p(x) = 2x^2 + 7x + 3$

मध्य पद विभक्त करके

मध्य पद $= 7x$

p व q दो संख्याएँ इस प्रकार होगा

$p + q = 7$

$pq = 2 \times 3$

$pq = 6$

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6 के गुणनखंड

$\pm 1, \pm 2, \pm 3, \pm 6$

$1 \times 6 = 6 \Rightarrow 1 + 6 = 7$

$2 \times 3 = 6 \Rightarrow 2 + 3 = 5$



मध्य पद $= 7x$

$= x + 6x$

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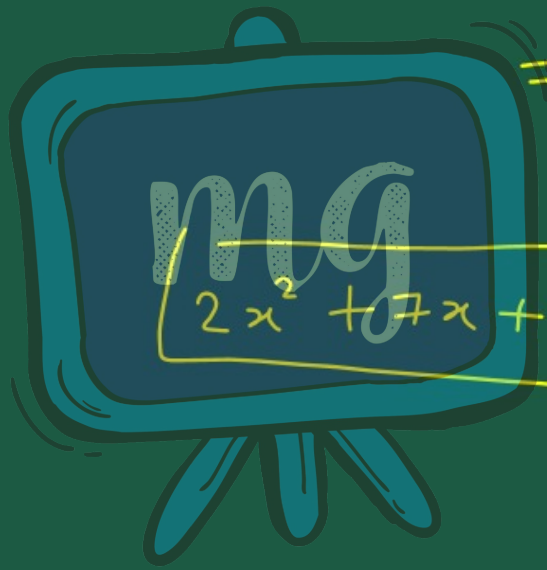
$$p(x) = 2x^2 + 7x + 3$$

$$= 2x^2 + x + 6x + 3$$

$$= x(2x+1) + 3(2x+1)$$

$$= (2x+1)(x+3)$$

$$2x^2 + 7x + 3 = (2x+1)(x+3)$$



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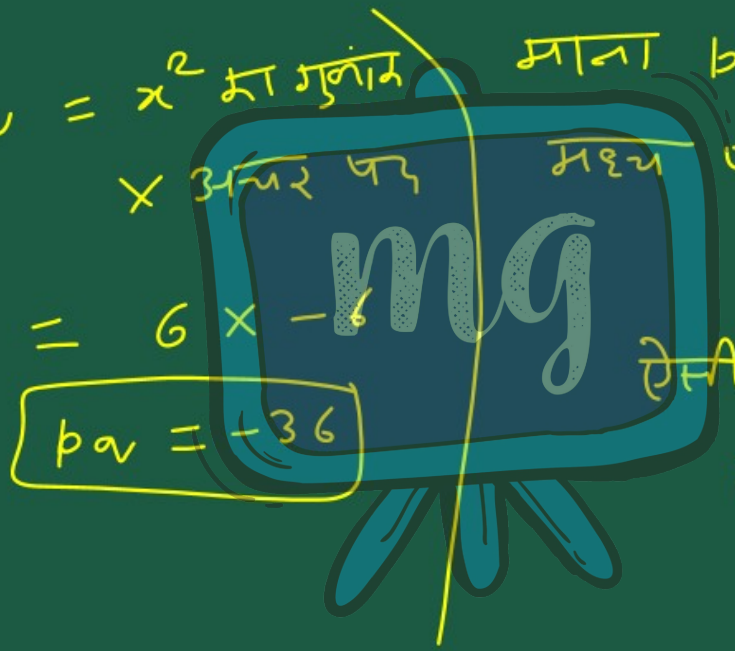
(iii) $6x^2 + 5x - 6$



माना $p(x) = 6x^2 + 5x - 6$

pq = x^2 का गुणांक

× अग्र पद

= 6×-6

$pq = -36$

मध्य पद को विभक्त करके

मध्य पद = $5x$

ऐसी दो संख्याएँ p व q विद्यमान हैं कि

$p + q = 5$

$pq = 6 \times -6$

$pq = -36$

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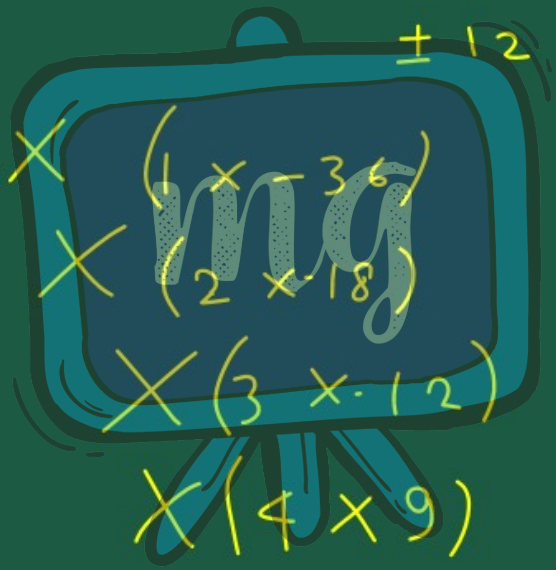
-36 का गुणनखंड

$\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 9, \pm 12, \pm 18, \pm 36$



$-4 \times 9 = -36$

or

$-9 \times 4 = -36$

$-4 + 9 = 5$

~~$-9 + 4 = -5$~~

$(-4, 9)$

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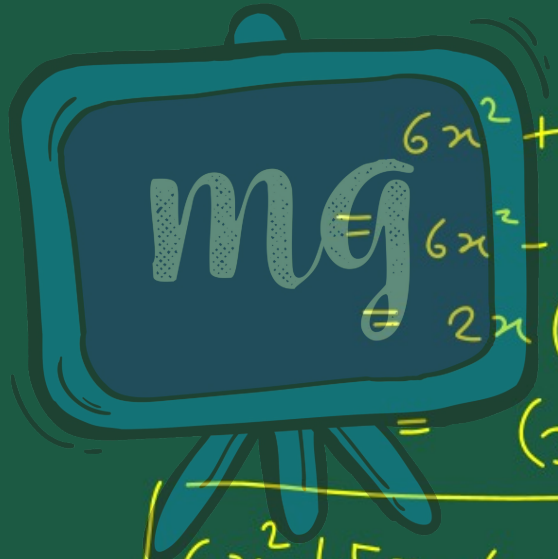
$6x^2 + 5x - 6$

मध्य पद $= 5x$

$= -4x + 9x$



$6x^2 + 5x - 6$

$= 6x^2 - 4x + 9x - 6$

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

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

$6x^2 + 5x - 6 = (3x-2)(2x+3)$

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(iv) $3x^2 - x - 4$

माना $p(x) = 3x^2 - x - 4$

$pq = x^2$ का गुणांक $\times$ अचर पद

$= 3 \times -4$

$= -12$

मध्य पद को विभक्त करके

मध्य पद $= -x$

p व q ऐसी दो संख्या विद्यमान होगी कि

$p + q = -1$

$pq = -12$



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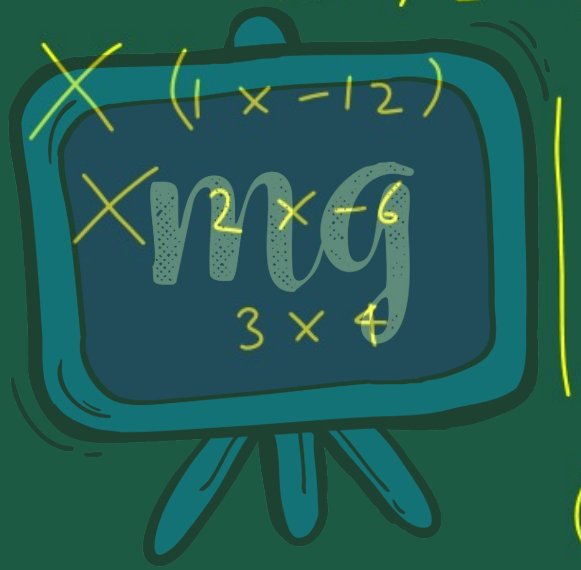
-12 के गुणनखंड

$\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12$



$-3 \times 4 = -12$

$-3 + 4 = 1$

$-4 \times 3 = -12$

$-4 + 3 = -1$

$(-4, 3)$

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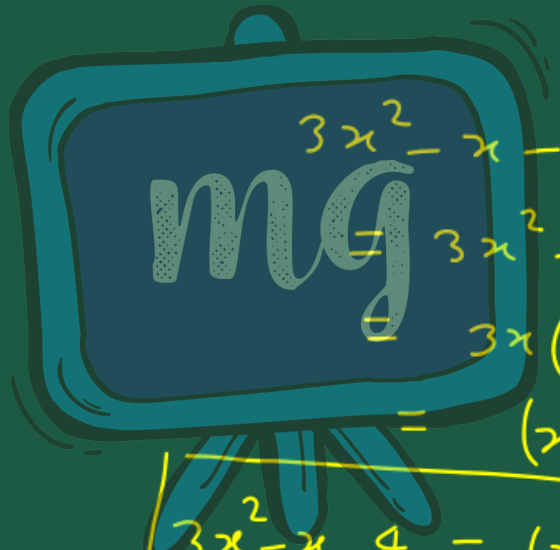
$3x^2 - x - 4$

मध्य पद $= -x$

$= -4x + 3x$



$3x^2 - x - 4$

$= 3x^2 + 3x - 4x - 4$

$= 3x(x+1) - 4(x+1)$

$= (x+1)(3x-4)$

$3x^2 - x - 4 = (x+1)(3x-4)$