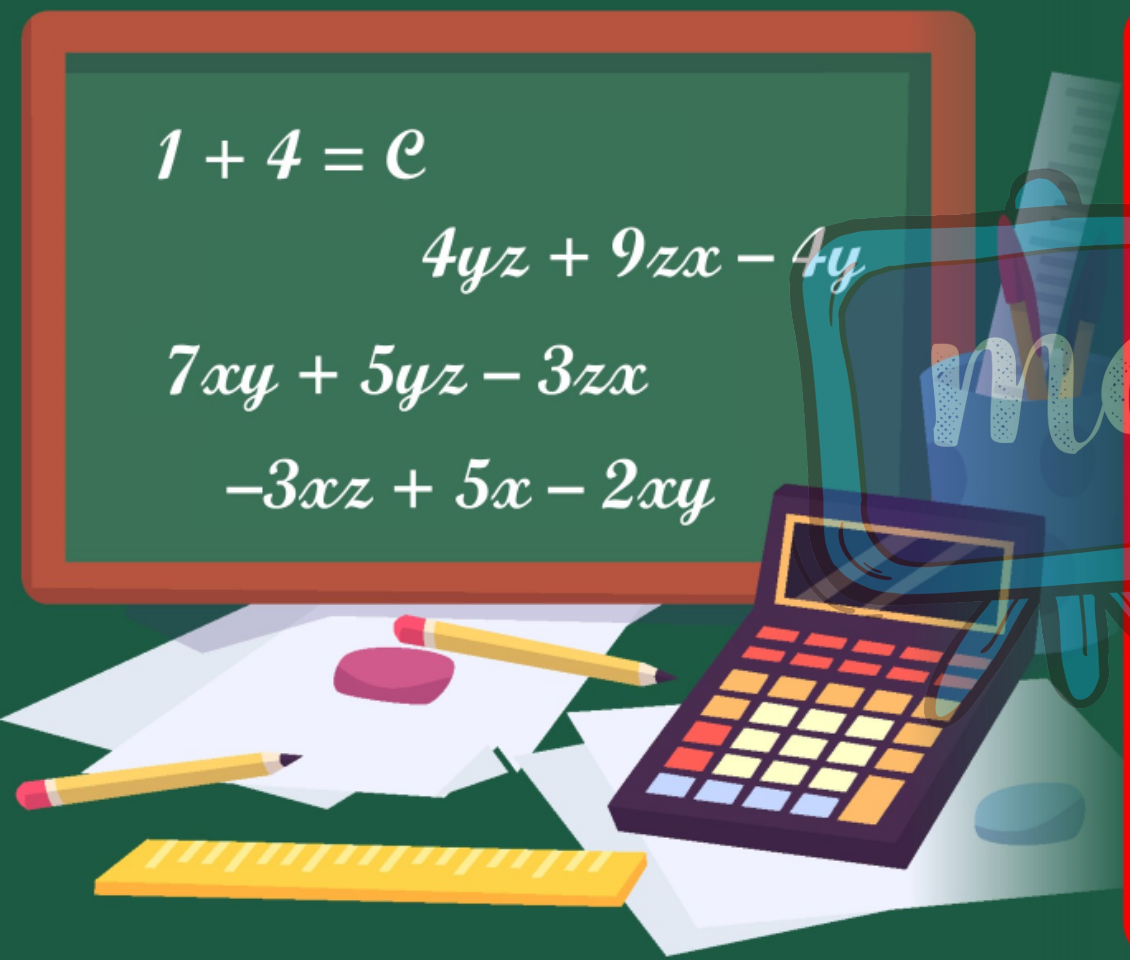
Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER



कक्षा - 8

गणित

अध्याय - 8

बीजीय व्यंजक एवं सर्वसमिकाएँ

भाग - 5

बहुपद को बहुपद से गुणा करना तथा

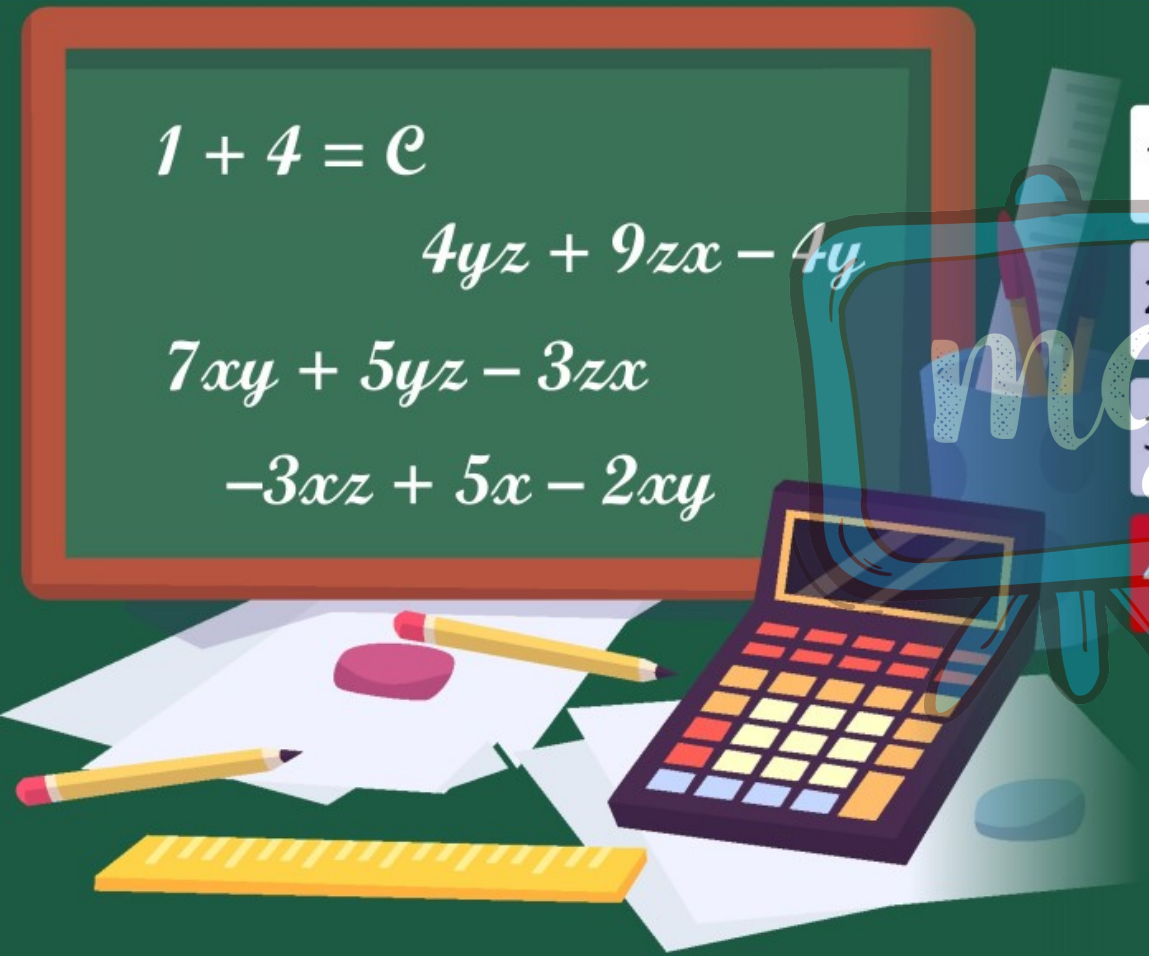
प्रश्नावली 8.4

राम राईका

Under CSR Support by ipca | Foundation

विवरण (Overview)

missiongyan LET'S LEARN TOGETHER

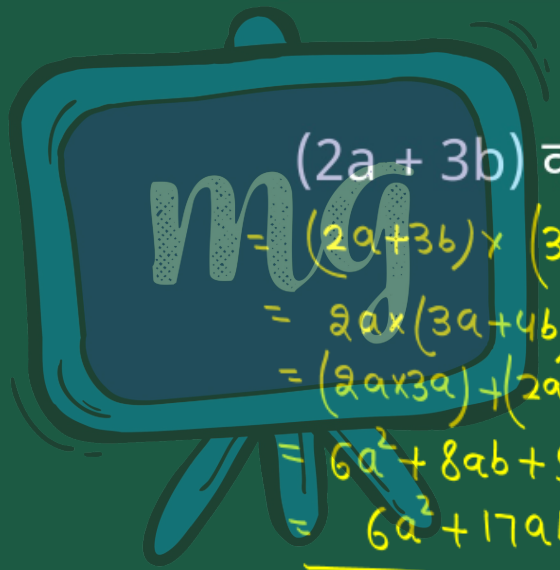


1. बीजीय व्यंजकों का योग एवं व्यवकलन
2. एकपदी को एकपदी से गुणा करना
3. एकपदी को बहुपद से गुणा करना
4. बहुपद को बहुपद से गुणा करना

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

बहुपद को बहुपद से गुणा करना



(2a + 3b) का (3a + 4b) से गुणा

$= (2a+3b) \times (3a+4b)$

$= 2a \times (3a+4b) + 3b \times (3a+4b)$

$= (2a \times 3a) + (2a \times 4b) + (3b \times 3a) + (3b \times 4b)$

$= 6a^2 + 8ab + 9ab + 12b^2$

$= 6a^2 + 17ab + 12b^2$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

उदाहरण–8

गुणा कीजिए :

(i) $(x - 4)$ एवं $(2x + 3)$ को

$= (x-4) \times (2x+3)$

$= x \times (2x+3) - 4 \times (2x+3)$

$= (x \times 2x) + (x \times 3) - (4 \times 2x) - (4 \times 3)$

$= 2x^2 + 3x - 8x - 12$

$= 2x^2 - 5x - 12$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(ii) $(x - y)$ एवं $(3x + 5y)$ को

$$= (x-y) \times (3x+5y)$$

$$= x \times (3x+5y) - y \times (3x+5y)$$

$$= (x \times 3x) + (x \times 5y) - (y \times 3x) - (y \times 5y)$$

$$= 3x^2 + 5xy - 3xy - 5y^2$$

$$= 3x^2 + 2xy - 5y^2$$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

उदाहरण-9

गुणा कीजिए :

(i) (a + 7) और (b – 5) को

$= (a+7) \times (b-5)$

$= a \times (b-5) + 7 \times (b-5)$

$= (a \times b) - (a \times 5) + (7 \times b) - (7 \times 5)$

$= ab - 5a + 7b - 35$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(ii) $(a^2 + 2b^2)$ और $(5a - 3b)$ को

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

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

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

$= 5a^3 - 3a^2b + 10ab^2 - 6b^3$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

उदाहरण–10

सरल कीजिए :

$(a + b)(2a - 3b + c) - (2a - 3b)c$

$= (a+b) \times (2a-3b+c) - c \times (2a-3b)$

$= a \times (2a-3b+c) + b \times (2a-3b+c) - c \times (2a-3b)$

$= (a \times 2a) - (a \times 3b) + (a \times c) + (b \times 2a) - (b \times 3b) + (b \times c) - (c \times 2a) + (c \times 3b)$

$= 2a^2 - 3ab + ac + 2ab - 3b^2 + bc - 2ac + 3bc$

$= 2a^2 - ab - ac - 3b^2 + 4bc$

$= 2a^2 - 3b^2 - ab + 4bc - ac$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

प्रश्नावली 8.4

1. द्विपदों को गुणा कीजिए :

(i) $(2x + 5)$ और $(4x - 3)$

$= (2x+5) \times (4x-3)$

$= 2x \times (4x-3) + 5 \times (4x-3)$

$= (2x \times 4x) - (2x \times 3) + (5 \times 4x) - (5 \times 3)$

$= 8x^2 - 6x + 20x - 15$

$= 8x^2 + 14x - 15$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(ii) (y – 8) और (3y – 4)

$= (y-8) \times (3y-4)$

$= y \times (3y-4) - 8(3y-4)$

$= (y \times 3y) - (y \times 4) - (8 \times 3y) + (8 \times 4)$

$= 3y^2 - 4y - 24y + 32$

$= 3y^2 - 28y + 32$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(iii) $(2.5l - 0.5m)$ और $(2.5l + 0.5m)$

$$= (2.5l - 0.5m) \times (2.5l + 0.5m)$$

$$= 2.5l \times (2.5l + 0.5m) - 0.5m \times (2.5l + 0.5m)$$

$$= (2.5l \times 2.5l) + (2.5l \times 0.5m) - (0.5m \times 2.5l) - (0.5m \times 0.5m)$$

$$= 6.25l^2 + 1.25lm - 1.25lm - 0.25m^2$$

$$= 6.25l^2 - 0.25m^2$$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(iv) (a + 3b) और $(x + 5)$

$= (a+3b) \times (x+5)$

$= a x (x+5) + 3b \times (x+5)$

$= (a \times x) + (a \times 5) + (3b \times x) + (3b \times 5)$

$= ax + 5a + 3bx + 15b$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(v) $(2pq + 3q^2)$ और $(3pq - 2q^2)$

$= (2pq + 3q^2) \times (3pq - 2q^2)$

$= 2pq \times (3pq - 2q^2) + 3q^2 \times (3pq - 2q^2)$

$= (2pq \times 3pq) - (2pq \times 2q^2) + (3q^2 \times 3pq) - (3q^2 \times 2q^2)$

$= 6p^2q^2 - 4pq^3 + 9pq^3 - 6q^4$

$= 6p^2q^2 + 5pq^3 - 6q^4$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(vi) $\left(\frac{3}{4}a^2+3b^2\right)$ और $4\left(a^2-\frac{2}{3}b^2\right)$

$= \left(\frac{3}{4}a^2+3b^2\right)\times 4\left(a^2-\frac{2}{3}b^2\right)$

$= \left(\frac{3}{4}a^2+3b^2\right)\times\left(4\times a^2-4\times\frac{2}{3}b^2\right)$

$= \left(\frac{3}{4}a^2+3b^2\right)\times\left(4a^2-\frac{8}{3}b^2\right)$

$= \frac{3}{4}a^2\times\left(4a^2-\frac{8}{3}b^2\right)+3b^2\times\left(4a^2-\frac{8}{3}b^2\right)$

$= \left(\frac{3}{4}a^2\times 4a^2\right)-\left(\frac{3}{4}a^2\times\frac{8}{3}b^2\right)+\left(3b^2\times 4a^2\right)-\left(3b^2\times\frac{8}{3}b^2\right)$

$= 3a^4-2a^2b^2+12a^2b^2-8b^4$

$= 3a^4+10a^2b^2-8b^4$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

2. गुणनफल ज्ञात कीजिए :

(i) $(5 - 2x)(3 + x)$

$= (5-2x) \times (3+x)$

$= 5x(3+x) - 2x \times (3+x)$

$= (5\times3) + (5\times x) - (2x\times3) - (2x\times x)$

$= 15 + 5x - 6x - 2x^2$

$= 15 - x - 2x^2$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(ii) $(x + 7y)(7x - y)$

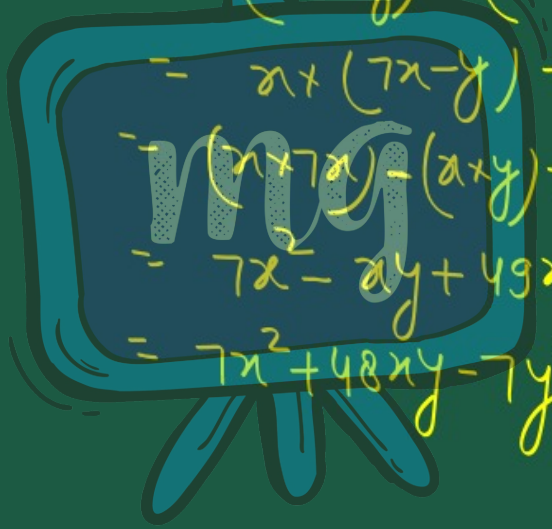
$= (x+7y) \times (7x-y)$

$= x \times (7x-y) + 7y \times (7x-y)$

$= (x \times 7x) - (x \times y) + (7y \times 7x) - (7y \times y)$

$= 7x^2 - xy + 49xy - 7y^2$

$= 7x^2 + 48xy - 7y^2$



Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

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

$= (a^2+b) \times (a+b^2)$

$= a^2 \times (a+b^2) + b \times (a+b^2)$

$= (a^2 \times a) + (a^2 \times b^2) + (b \times a) + (b \times b^2)$

$= a^3 + a^2b^2 + ab + b^3$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(iv) $(p^2 - q^2)(2p + q)$

$= (p^2 - q^2) \times (2p + q)$

$= p^2 \times (2p + q) - q^2 \times (2p + q)$

$= (p^2 \times 2p) + (p^2 \times q) - (q^2 \times 2p) - (q^2 \times q)$

$= 2p^3 + p^2q - 2pq^2 - q^3$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

3. सरल कीजिए :

(i) $(x^2 - 5)(x + 5) + 25$

$= (x^2-5) \times (x+5) + 25$

$= x^2 \times (x+5) - 5 \times (x+5) + 25$

$= (x^2 \times x) + (x^2 \times 5) - (5 \times x) - (5 \times 5) + 25$

$= x^3 + 5x^2 - 5x - 25 + 25$

$= x^3 + 5x^2 - 5x$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(ii) $(a^2 + 5)(b^3 + 3) + 5$

$= (a^2+5) \times (b^3+3) + 5$

$= a^2 \times (b^3+3) + 5 \times (b^3+3) + 5$

$= (a^2 \times b^3) + (a^2 \times 3) + (5 \times b^3) + (5 \times 3) + 5$

$= a^2b^3 + 3a^2 + 5b^3 + 15 + 5$

$= a^2b^3 + 3a^2 + 5b^3 + 20$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(iii) $(t + s^2)(t^2 - s)$

$= (t + s^2) \times (t^2 - s)$

$= t \times (t^2 - s) + s^2 \times (t^2 - s)$

$= (t \times t^2) - (t \times s) + (s^2 \times t^2) - (s^2 \times s)$

$= t^3 - st + s^2t^2 - s^3$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(iv) $(a + b)(c - d) + (a - b)(c + d) + 2(ac + bd)$

$= (a+b)\times(c-d) + (a-b)\times(c+d) + 2\times(ac+bd)$

$= a\times(c-d) + b\times(c-d) + a\times(c+d) - b\times(c+d) + 2\times(ac+bd)$

$= (a\times c) - (a\times d) + (b\times c) - (b\times d) + (a\times c) + (a\times d) - (b\times c) - (b\times d) + (2\times ac) + (2\times bd)$

$= ac - ad + bc - bd + ac + ad - bc - bd + 2ac + 2bd$

$= ac + ac + 2ac$

$= 4ac$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

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

$= (x+y) \times (2x+y) + (x+2y) \times (x-y)$

$= x \times (2x+y) + y \times (2x+y) + x \times (x-y) + 2y \times (x-y)$

$= (x \times 2x) + (x \times y) + (y \times 2x) + (y \times y) + (x \times x) - (x \times y) + (2y \times x) - (2y \times y)$

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

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

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

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

$\Rightarrow (x+y)\times(x^2-xy+y^2)$

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

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

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

$= x^3 + y^3$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(vii) $(1.5x - 4y)(1.5x + 4y + 3)$

$= (1.5x - 4y) \times (1.5x + 4y + 3) - 4.5x + 12y$

$= 1.5x \times (1.5x + 4y + 3) - 4y \times (1.5x + 4y + 3) - 4.5x + 12y$

$= (1.5x \times 1.5x) + (1.5x \times 4y) + (1.5x \times 3) - (4y \times 1.5x) - (4y \times 4y) - (4y \times 3) - 4.5x + 12y$

$= 2.25x^2 + 6xy + 4.5x - 6xy - 16y^2 - 12y - 4.5x + 12y$

$= 2.25x^2 - 16y^2$

Under CSR Support by ipca | Foundation

missiongyan LET'S LEARN TOGETHER

(viii) $(a + b + c)(a + b - c)$

$= (a+b+c) \times (a+b-c)$

$= a \times (a+b-c) + b \times (a+b-c) + c \times (a+b-c)$

$= (a \times a) + (a \times b) - (a \times c) + (b \times a) + (b \times b) - (b \times c) + (c \times a) + (c \times b) - (c \times c)$

$= a^2 + ab - ac + ab + b^2 - bc + ac + bc - c^2$

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