Fundamental Operation

(i) $5+4=9$ and $5x+4x=9x$

(ii) $12+18=30$ and $12x^2y+18x^2y=30x^2y$

(iii) $7+16=23$ and $7a+16b=7a+16b$

(iv) $1+3=4$ and $1x^2y+3x^2y=3x^2y$

(v) $7-4=3$ and $7ab-4ab=3ab$

(vi) $12-5=7$ and $12x-5x=7x$

(vii) $35-16=19$ and $35ab-16ba=19ab$

(viii) $28-13=15$ and $28a^2x-12a^2x=16a^2x$

$-12a^2x$

2 (i) The sum of -2 and $-5=-7$ and the sum of $-2x$ and $-5x=-7x$.

(ii) The sum of 8 and -3 is 5 and the sum of $8ab$ and $3ab$ is $5ab$.

(iii) The sum of -15 and $-4 = -19$ and the sum of $-15x$ and $-4y = -15x$ and $-4y$

(iv) $15+8+3 = 26$ and $15x + 8y + 3x = 15x + 8y + 3x$.

(v) $12 - 9 + 15 = 18$ and $12ab - 9ab + 15ba = 12ab - 9ab + 15ba$.

(vi) $25 - 7 - 9 = 9$ and $25xy - 7xy - 9yx = 25xy - 7xy - 9yx$

(vii) $-4 - 6 - 5 = -3$ and $-4ax - 6ax - 5ay = -4ax - 6ax - 5ay$.

3. (i) $8xy$ and $3xy = 11xy$

(ii) $2xyz$, xyz and $6xyz = 9xyz$

(iii) $2a$, $3a$ and $4b = 5a + 4b$

(iv) $3x$ and $2y = 3x + 2y$

(v) $5m$, $3n$ and $4p = 5m + 3n + 4p$

(vi) $6a, 3a$ and $9ab = 9a + 9ab$

(vii) $3p, 4p$ and $9p = 16p$

(viii) $5ab, 4ba$ and $6b = 5ab + 4ba + 6b$

(ix) $50pq, 30pq$ and $10pr = 80pq + 10pr$

(x) $-2y, -y, -3y = -6y$

(xi) $-3b$ and $-b = -4b$

(xii) $5b, -4b$ and $-10b = -9b$

(xiii) $-2c, -c$ and $-5c = -8c$

4. (i) $6a - a - 5a - 2a = -2a$

(ii) $2b - 3b - b + 4b = 2b$

(iii) $3x - 2x - 4x + 7x = 4x$

(iv) $5ab + 2ab - 6ab + ab = 2ab$

(v) $8x - 5y - 3x + 10y$

$= 8x - 3x - 5y + 10y$

$= 5x + 5y$

5(i) $-7x + 9x + 2x - 2x = 2x$

(ii) $5ab - 2ab - 8ab + 6ab = (5 - 2 - 8 + 6)ab$

$= 1ab$

(iii) $-8a - 3a + 12a + 13a - 6a$

$= (8 - 3 + 12 + 13 - 6)a$

$= 24a$

(iv) $19abc - 11abc - 12abc + 14abc$

$= (19 - 11 - 12 + 14)abc$

$= 10abc$

~~6(i) $4ab, 6ab = 6ab - 4ab = 2ab$~~

6(i) $4ab, 6ba = 6ba - 4ab = 6ba - 4ab$

(ii) $4 \cdot 8b, 6 \cdot 8b = 6 \cdot 8b - 4 \cdot 8b = 2b$

(iii) $3 \cdot 5abc, 10 \cdot 5abc = 10 \cdot 5abc - 3 \cdot 5abc = 7abc$

(iv) $3\frac{1}{2}mn, 8\frac{1}{2}nm = \frac{7}{2}mn, \frac{17}{2}nm = \frac{17}{2}nm - \frac{7}{2}mn$

7(i) $2a^2b^2 + 5ab^2 + 8a^2b^2 - 3ab^2$

$= 2a^2b^2 + 8a^2b^2 + 5ab^2 - 3ab^2$

$= 10a^2b^2 + 2ab^2$

(ii) $4a + 3b - 2a - b$

$= 4a + 2a - 3b - b$

$= 6a - 2b$

(iii) $2xy + 4yz + 5xy + 3yz - 6xy$

$= 2xy + 5xy - 6xy + 4yz + 3yz$

$= 7xy - 6xy + 7yz$

$= 1xy + 7yz$

iv) $ab + 15ab - 11ab - 2ab$

$= 3ab$

(v) $6a^2 - 3b^2 + 2a^2 + 5b^2 - 4a^2$

$= 6a^2 + 2a^2 - 4a^2 - 3b^2 + 5b^2$

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

$= 4a^2 + 2b^2$

vi) $8abc + 2ab - 4abc + ab$

$= 8abc - 4abc + 2ab + ab$

$= 4abc + 3ab$

vii) $9xyz + 5yxz - 10zyx - 2zxy$

$= 9xyz + 15xyz - 10xyz - 2xyz$

$= 24xyz - 12xyz = 12xyz$

viii) $13pqrn + 2p + 4p - 6pqrn + 5pqrn$

$= 13pqrn - 6pqrn + 5pqrn + 2p + 4p$

$= 7pqrn - 5pqrn + 6p$

$= 2pqrn + 6p$

(ix) $4abt + 0 - 2ba$

$= 4ab - 2ba$

$= 2ab$

(x) $6x^2y - 2xy^2 + 5x^2y - xy^2$

$= 6x^2y + 5x^2y - 2xy^2 - xy^2$

$= 11x^2y - 1xy^2$