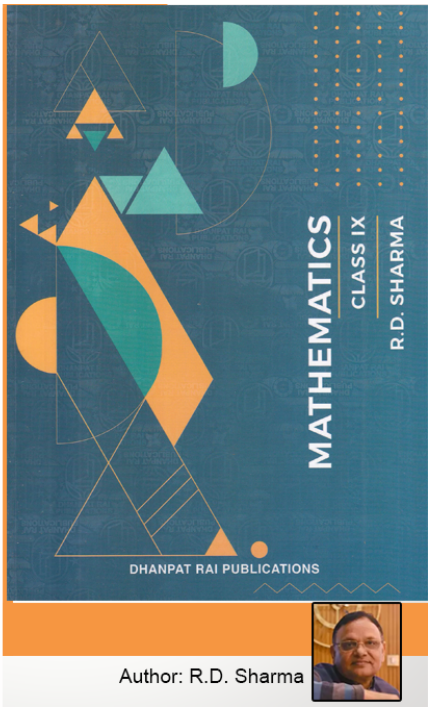
Class 9 - Chapter 5 Factorization of Algebraic Expressions



RD Sharma Solutions for Class 9 Maths Chapter 5–Factorization of Algebraic Expressions

Class 9: Maths Chapter 5 solutions. Complete Class 9 Maths Chapter 5 Notes.

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RD Sharma 9th Maths Chapter 5, Class 9 Maths Chapter 5 solutions

Exercise 5.1 Page No: 5.9

Question 1: Factorize $x^3 + x – 3x^2 – 3$

Solution:

$x^3 + x – 3x^2 – 3$

Here x is common factor in $x^3 + x$ and – 3 is common factor in $– 3x^2 – 3$

$x^3 – 3x^2 + x – 3$

$x^2 (x – 3) + 1(x – 3)$

Taking (x – 3) common

$(x – 3) (x^2 + 1)$

Therefore $x^3 + x – 3x^2 – 3 = (x – 3) (x^2 + 1)$

Question 2: Factorize $a(a + b)^3 – 3a^2b(a + b)$

Solution:

$a(a + b)^3 – 3a^2b(a + b)$

Taking a (a + b) as common factor

$= a(a + b) \{(a + b)^2 – 3ab\}$

$= a(a + b) \{a^2 + b^2 + 2ab – 3ab\}$

$= a(a + b) (a^2 + b^2 – ab)$

Question 3: Factorize $x(x^3 – y^3) + 3xy(x – y)$

Solution:

$x(x^3 – y^3) + 3xy(x – y)$

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

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Taking x(x – y) as a common factor

= x(x – y) (x^2 + xy + y^2 + 3y)

= x(x – y) (x^2 + xy + y^2 + 3y)

Question 4: Factorize a^2x^2 + (ax^2 + 1)x + a

Solution:

a^2x^2 + (ax^2 + 1)x + a

= a^2x^2 + a + (ax^2 + 1)x

= a(ax^2 + 1) + x(ax^2 + 1)

= (ax^2 + 1) (a + x)

Question 5: Factorize x^2 + y – xy – x

Solution:

x^2 + y – xy – x

= x^2 – x – xy + y

= x(x- 1) – y(x – 1)

= (x – 1) (x – y)

Question 6: Factorize x^3 – $2x^2y$ + $3xy^2$ – $6y^3$

Solution:

x^3 – $2x^2y$ + $3xy^2$ – $6y^3$

= x^2(x – 2y) + $3y^2$(x – 2y)

= (x – 2y) (x^2 + $3y^2$)

Question 7: Factorize 6ab – b^2 + 12ac – 2bc

Solution:

$6ab – b^2 + 12ac – 2bc$

$= 6ab + 12ac – b^2 – 2bc$

Taking 6a common from first two terms and –b from last two terms

$= 6a(b + 2c) – b(b + 2c)$

Taking (b + 2c) common factor

$= (b + 2c) (6a – b)$

Question 8: Factorize $(x^2 + 1/x^2) – 4(x + 1/x) + 6$

Solution:

$(x^2 + 1/x^2) – 4(x + 1/x) + 6$

$= x^2 + 1/x^2 – 4x – 4/x + 4 + 2$

$= x^2 + 1/x^2 + 4 + 2 – 4/x – 4x$

$= (x^2) + (1/x)^2 + (-2)^2 + 2x(1/x) + 2(1/x)(-2) + 2(-2)x$

As we know, $x^2 + y^2 + z^2 + 2xy + 2yz + 2zx = (x+y+z)^2$

So, we can write;

$= (x + 1/x + (-2))^2$

or $(x + 1/x – 2)^2$

Therefore, $x^2 + 1/x^2) – 4(x + 1/x) + 6 = (x + 1/x – 2)^2$

Question 9: Factorize x(x – 2) (x – 4) + 4x – 8

Solution:

$x(x – 2) (x – 4) + 4x – 8$

$= x(x – 2) (x – 4) + 4(x – 2)$

$= (x – 2) [x(x – 4) + 4]$

= (x – 2) (x^2 – 4x + 4)

= (x – 2) [x^2 – 2 (x)(2) + $(2)^2$]

= (x – 2) $(x – 2)^2$

= $(x – 2)^3$

Question 10: Factorize (x + 2) (x^2 + 25) – $10x^2$ – 20x

Solution :

(x + 2) (x^2 + 25) – 10x (x + 2)

Take (x + 2) as common factor;

= (x + 2)(x^2 + 25 – 10x)

=(x + 2) (x^2 – 10x + 25)

Expanding the middle term of (x^2 – 10x + 25)

=(x + 2) (x^2 – 5x – 5x + 25)

=(x + 2){ x (x – 5) – 5 (x – 5)}

=(x + 2)(x – 5)(x – 5)

=(x + 2)$(x – 5)^2$

Therefore, (x + 2) (x^2 + 25) – 10x (x + 2) = (x + 2)$(x – 5)^2$

Question 11: Factorize $2a^2$ + 2√6 ab + $3b^2$

Solution:

$2a^2$ + 2√6 ab + $3b^2$

Above expression can be written as $(\sqrt{2}a)^2 + 2 \times \sqrt{2}a \times \sqrt{3}b + (\sqrt{3}b)^2$

As we know, $(p + q)^2 = p^2 + q^2 + 2pq$

Here p = √2a and q = √3b

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= $(\sqrt{2}a + \sqrt{3}b)^2$

Therefore, $2a^2 + 2\sqrt{6}ab + 3b^2 = (\sqrt{2}a + \sqrt{3}b)^2$

Question 12: Factorize $(a – b + c)^2 + (b – c + a)^2 + 2(a – b + c)(b – c + a)$

Solution:

$(a – b + c)^2 + (b – c + a)^2 + 2(a – b + c)(b – c + a)$

{Because $p^2 + q^2 + 2pq = (p + q)^2$}

Here $p = a – b + c$ and $q = b – c + a$

$= [a – b + c + b - c + a]^2$

$= (2a)^2$

$= 4a^2$

Question 13: Factorize $a^2 + b^2 + 2(ab+bc+ca)$

Solution:

$a^2 + b^2 + 2ab + 2bc + 2ca$

As we know, $p^2 + q^2 + 2pq = (p + q)^2$

We get,

$= (a+b)^2 + 2bc + 2ca$

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

Or $(a+b)^2 + 2c(a + b)$

Take $(a + b)$ as common factor;

$= (a + b)(a + b + 2c)$

Therefore, $a^2 + b^2 + 2ab + 2bc + 2ca = (a + b)(a + b + 2c)$

Question 14: Factorize $4(x-y)^2 – 12(x – y)(x + y) + 9(x + y)^2$

Solution :

Consider (x – y) = p, (x + y) = q

$= 4p^2 – 12pq + 9q^2$

Expanding the middle term, -12 = -6 -6 also 4× 9=-6 × -6

$= 4p^2 – 6pq – 6pq + 9q^2$

$=2p(2p – 3q) -3q(2p – 3q)$

$= (2p – 3q) (2p – 3q)$

$= (2p – 3q)^2$

Substituting back p = x – y and q = x + y;

$= [2(x-y) – 3(x+y)]^2 = [2x – 2y – 3x – 3y]^2$

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

$=[-x – 5y]^2$

$=[(-1)(x+5y)]^2$

$=(x+5y)^2$

Therefore, $4(x-y)^2 – 12(x – y)(x + y) + 9(x + y)^2 = (x+5y)^2$

Question 15: Factorize $a^2 – b^2 + 2bc – c^2$

Solution :

$a^2 – b^2 + 2bc – c^2$

As we know, $(a-b)^2 = a^2 + b^2 – 2ab$

$= a^2 – (b – c)^2$

Also we know, $a^2 – b^2 = (a+b)(a-b)$

$= (a + b – c)(a – (b – c))$

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= (a + b – c)(a – b + c)

Therefore, $a^2 – b^2 + 2bc – c^2 =$(a + b – c)(a – b + c)

Question 16: Factorize $a^2 + 2ab + b^2 – c^2$

Solution:

$a^2 + 2ab + b^2 – c^2$

$= (a^2 + 2ab + b^2) – c^2$

$= (a + b)^2 – (c)^2$

We know, $a^2 – b^2 = (a + b) (a – b)$

= (a + b + c) (a + b – c)

Therefore $a^2 + 2ab + b^2 – c^2 = (a + b + c) (a + b – c)$

Exercise 5.2 Page No: 5.13

Factorize each of the following expressions:

Question 1: $p^3 + 27$

Solution:

$p^3 + 27$

$= p^3 + 3^3$[using $a^3 + b^3 = (a + b)(a^2 –ab + b^2)$]

$= (p + 3)(p^2 – 3p – 9)$

Therefore, $p^3 + 27 = (p + 3)(p^2 – 3p – 9)$

Question 2: $y^3 + 125$

Solution:

$y^3 + 125$

= $y^3 + 5^3$[using $a^3 + b^3 = (a + b)(a^2 – ab + b^2)$]

= $(y+5)(y^2 - 5y + 5^2)$

= $(y + 5)(y^2 - 5y + 25)$

Therefore, $y^3 + 125 = (y + 5)(y^2 - 5y + 25)$

Question 3: $1 – 27a^3$

Solution:

= $(1)^3 - (3a)^3$[using $a^3 – b^3 = (a – b)(a^2 + ab + b^2)$]

= $(1- 3a)(1^2 + 1\times3a + (3a)^2)$

= $(1-3a)(1 + 3a + 9a^2)$

Therefore, $1-27a^3 = (1-3a)(1 + 3a+ 9a^2)$

Question 4: $8x^3y^3 + 27a^3$

Solution:

$8x^3y^3 + 27a^3$

= $(2xy)^3 + (3a)^3$[using $a^3 + b^3 = (a + b)(a^2 – ab + b^2)$]

= $(2xy +3a)((2xy)^2 - 2xy\times3a+(3a)^2)$

= $(2xy+3a)(4x^2y^2 - 6xya + 9a^2)$

Question 5: $64a^3 – b^3$

Solution:

$64a^3 - b^3$

= $(4a)^3 - b^3$[using $a^3 – b^3 = (a – b)(a^2 + ab + b^2)$]

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

= $(4a-b)(16a^2 +4ab+b^2)$

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Question 6: $x^3 / 216 – 8y^3$

Solution:

$x^3 / 216 – 8y^3$

$$=\left(\frac{x}{6}\right)^3-(2y)^3$$

$$\because\left[x^3-y^3=(x-y)\left(x^2+xy+y^2\right)\right]$$

$$=\left(\frac{x}{6}-2y\right)\left(\left(\frac{x}{6}\right)^2+\frac{x}{6}\times 2y+(2y)^2\right)$$

$$=\left(\frac{x}{6}-2y\right)\left(\frac{x^2}{36}+\frac{xy}{3}+4y^2\right)$$

$$\therefore\ \frac{x^3}{216}-8y^3=\left(\frac{x}{6}-2y\right)\left(\frac{x^2}{36}+\frac{xy}{3}+4y^2\right)$$

Question 7: $10x^4 y – 10xy^4$

Solution:

$10x^4 y – 10xy^4$

$= 10xy(x^3 − y^3)$[using $a^3 – b^3 = (a – b)(a^2 + ab + b^2)$]

$= 10xy\ (x−y)(x^2 + xy + y^2)$

Therefore, $10x^4 y – 10xy^4 = 10xy\ (x−y)(x^2 + xy + y^2)$

Question 8: $54x^6 y + 2x^3y^4$

Solution:

$54x^6 y + 2x^3y^4$

$= 2x^3y(27x^3 +y^3)$

$= 2x^3y((3x)^3 + y^3)$[using $a^3 + b^3 = (a + b)(a^2 – ab + b^2)$]

$= 2x^3y\ \{(3x+y)\ ((3x)^2−3xy+y^2)\}$

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$=2x^3y(3x+y)(9x^2 - 3xy + y^2)$

Question 9: $32a^3 + 108b^3$

Solution:

$32a^3 + 108b^3$

$= 4(8a^3 + 27b^3)$

$= 4((2a)^3+(3b)^3)$[using $a^3 + b^3 = (a + b)(a^2 – ab + b^2)$]

$= 4[(2a+3b)((2a)^2-2a\times3b+(3b)^2)]$

$= 4(2a+3b)(4a^2 - 6ab + 9b^2)$

Question 10: $(a-2b)^3 - 512b^3$

Solution:

$(a-2b)^3 - 512b^3$

$= (a-2b)^3 -(8b)^3$[using $a^3 – b^3 = (a – b)(a^2 + ab + b^2)$]

$= (a -2b-8b) \{(a-2b)^2 + (a-2b)8b + (8b)^2\}$

$=(a -10b)(a^2 + 4b^2 - 4ab + 8ab - 16b^2 + 64b^2)$

$=(a-10b)(a^2 + 52b^2 + 4ab)$

Question 11: $(a+b)^3 - 8(a-b)^3$

Solution:

$(a+b)^3 - 8(a-b)^3$

$= (a+b)^3 - [2(a-b)]^3$

$= (a+b)^3 - [2a-2b]^3$[using $p^3 – q^3 = (p – q)(p^2 + pq + q^2)$]

Here $p = a+b$ and $q = 2a-2b$

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

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

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

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

$=(3b-a)(3a^2+2ab-b^2+4a^2+4b^2-8ab)$

$=(3b-a)(3a^2+4a^2-b^2+4b^2-8ab+2ab)$

$=(3b-a)(7a^2+3b^2-6ab)$

Question 12: $(x+2)^3 + (x-2)^3$

Solution:

$(x+2)^3 + (x-2)^3$[using $p^3 + q^3 = (p + q)(p^2 – pq + q^2)$]

Here p = x + 2 and q = x – 2

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

$=2x(x^2+4x+4-(x+2)(x-2)+x^2-4x+4)$[Using : $(a+b)(a-b) = a^2-b^2$]

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

$= 2x(2x^2+8 - x^2 + 4)$

$= 2x(x^2 + 12)$

Exercise 5.3 Page No: 5.17

Question 1: Factorize $64a^3 + 125b^3 + 240a^2b + 300ab^2$

Solution:

$64a^3 + 125b^3 + 240a^2b + 300ab^2$

$= (4a)^3 + (5b)^3 + 3(4a)^2(5b) + 3(4a)(5b)^2$, which is similar to $a^3 + b^3 + 3a^2b + 3ab^2$

We know that, $a^3 + b^3 + 3a^2b + 3ab^2 = (a+b)^3$]

= $(4a+5b)^3$

Question 2: Factorize $125x^3 – 27y^3 – 225x^2y + 135xy^2$

Solution:

$125x^3 – 27y^3 – 225x^2y + 135xy^2$

Above expression can be written as $(5x)^3-(3y)^3-3(5x)^2(3y) + 3(5x)(3y)^2$

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

= $(5x - 3y)^3$

Question 3: Factorize $8/27\ x^3 + 1 + 4/3\ x^2 + 2x$

Solution:

$8/27\ x^3 + 1 + 4/3\ x^2 + 2x$

$$= \left(\frac{2}{3}x^3\right)^3 + 1^3 + 3 \times \left(\frac{2}{3}x\right)^2 \times 1 + 3(1)^2 \times \left(\frac{2}{3}x\right)$$

$$\left[\because x^3 + b^3 + 3x^2b + 3xb^2 = (x+b)^3\right]$$

$$\therefore \frac{8}{27}x^3 + 1 + \frac{4}{3}x^2 + 2x = \left(\frac{2}{3}x + 1\right)^3$$

Question 4: Factorize $8x^3 + 27y^3 + 36x^2y + 54xy^2$

Solution:

$8x^3 + 27y^3 + 36x^2y + 54xy^2$

Above expression can be written as $(2x)^3 + (3y)^3 + 3\times(2x)^2\times3y + 3\times(2x)(3y)^2$

Which is similar to $a^3 + b^3 + 3a^2b + 3ab^2 = (a + b)^3$]

Here a = 2x and b = 3y

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

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Therefore, $8x^3 + 27y^3 + 36x^2y + 54xy^2 = (2x+3y)^3$

Question 5: Factorize $a^3 - 3a^2b + 3ab^2 - b^3 + 8$

Solution:

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

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

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

Again , Using: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)]$

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

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

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

$a^3 - 3a^2b + 3ab^2 - b^3 + 8 =(a-b+2)(a^2+b^2-2ab-2a+2b+4)$

Exercise 5.4 Page No: 5.22

Factorize each of the following expressions:

Question 1: $a^3 + 8b^3 + 64c^3 - 24abc$

Solution:

$a^3 + 8b^3 + 64c^3 - 24abc$

$= (a)^3 + (2b)^3 + (4c)^3 - 3 \times a \times 2b \times 4c$[Using $a^3+b^3+c^3-3abc = (a+b+c)(a^2+b^2+c^2-ab-bc-ca)$]

$= (a+2b+4c)(a^2+(2b)^2 + (4c)^2-a \times 2b-2b \times 4c-4c \times a)$

$= (a+2b+4c)(a^2 +4b^2 +16c^2 -2ab-8bc-4ac)$

Therefore, $a^3 + 8b^3 + 64c^3 - 24abc = (a+2b+4c)(a^2 +4b^2 +16c^2 -2ab-8bc-4ac)$

Question 2: $x^3 - 8y^3 + 27z^3 + 18xyz$

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Solution:

$= x^3 - (2y)^3 + (3z)^3 - 3\times x\times(-2y)(3z)$

$= (x + (-2y) + 3z)\ (x^2 + (-2y)^2 + (3z)^2 - x(-2y) - (-2y)(3z) - 3z(x))$[using $a^3+b^3+c^3-3abc = (a+b+c)(a^2+b^2+c^2-ab-bc-ca)$]

$=(x - 2y + 3z)(x^2 + 4y^2 + 9z^2 + 2xy + 6yz - 3zx)$

Question 3: $27x^3 - y^3 - z^3 - 9xyz$

Solution:

$27x^3 - y^3 - z^3 - 9xyz$

$= (3x)^3 - y^3 - z^3 - 3(3xyz)$[Using $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2+b^2+c^2-ab-bc-ca)$]

Here a = 3x, b = -y and c = -z

$= (3x - y - z)\{ (3x)^2 + (- y)^2 + (- z)^2 + 3xy - yz + 3xz)\}$

$= (3x - y - z)\{ 9x^2 + y^2 + z^2 + 3xy - yz + 3xz)\}$

Question 4: $1/27\ x^3 - y^3 + 125z^3 + 5xyz$

Solution:

$1/27\ x^3 - y^3 + 125z^3 + 5xyz$

$= (x/3)^3+(-y)^3 +(5z)^3 - 3\ x/3\ (-y)(5z)$[Using $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2+b^2+c^2-ab-bc-ca)$]

$= (x/3 + (-y) + 5z)((x/3)^2 + (-y)^2 + (5z)^2 - x/3(-y) - (-y)5z - 5z(x/3))$

= (x/3 −y + 5z) (x^2/9 + y^2 + $25z^2$ + xy/3 + 5yz – 5zx/3)

Question 5: $8x^3 + 27y^3 - 216z^3 + 108xyz$

Solution:

$8x^3 + 27y^3 - 216z^3 + 108xyz$

$= (2x)^3 + (3y)^3 + (-6y)^3 - 3(2x)(3y)(-6z)$

$= (2x+3y+(-6z))\{ (2x)^2+(3y)^2+(-6z)^2 - 2x\times3y - 3y(-6z) - (-6z)2x\}$

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= $(2x+3y-6z)\{4x^2+9y^2+36z^2-6xy+18yz+12zx\}$

Question 6: $125+8x^3-27y^3+90xy$

Solution:

$125+8x^3-27y^3+90xy$

$=(5)^3+(2x)^3+(-3y)^3-3\times5\times2x\times(-3y)$

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

$=(5+2x-3y)(25+4x^2+9y^2-10x+6xy+15y)$

Question 7: $(3x-2y)^3+(2y-4z)^3+(4z-3x)^3$

Solution:

$(3x-2y)^3+(2y-4z)^3+(4z-3x)^3$

Let $(3x-2y)=a$, $(2y-4z)=b$, $(4z-3x)=c$

$a+b+c=3x-2y+2y-4z+4z-3x=0$

We know, $a^3+b^3+c^3-3abc=(a+b+c)(a^2+b^2+c^2-ab-bc-ca)$

$\Rightarrow a^3+b^3+c^3-3abc=0$

or $a^3+b^3+c^3=3abc$

$\Rightarrow (3x-2y)^3+(2y-4z)^3+(4z-3x)^3=3(3x-2y)(2y-4z)(4z-3x)$

Question 8: $(2x-3y)^3+(4z-2x)^3+(3y-4z)^3$

Solution:

$(2x-3y)^3+(4z-2x)^3+(3y-4z)^3$

Let $2x-3y=a$, $4z-2x=b$, $3y-4z=c$

$a+b+c=2x-3y+4z-2x+3y-4z=0$

We know, $a^3+b^3+c^3-3abc=(a+b+c)(a^2+b^2+c^2-ab-bc-ca)$

$\Rightarrow a^3 + b^3 + c^3 - 3abc = 0$

$(2x-3y)^3 + (4z-2x)^3 + (3y-4z)^3 = 3(2x-3y)(4z-2x)(3y-4z)$

Exercise VSAQs Page No: 5.24

Question 1: Factorize $x^4 + x^2 + 25$

Solution:

$x^4 + x^2 + 25$

$= (x^2)^2 + 5^2 + x^2$[using $a^2 + b^2 = (a + b)^2 - 2ab$]

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

$=(x^2+5)^2 - 10x^2 + x^2$

$=(x^2 + 5)^2 - 9x^2$

$=(x^2 + 5)^2 - (3x)^2$[using $a^2 - b^2 = (a + b)(a - b$]

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

Question 2: Factorize $x^2 - 1 - 2a - a^2$

Solution:

$x^2 - 1 - 2a - a^2$

$x^2 - (1 + 2a + a^2)$

$x^2 - (a + 1)^2$

$(x - (a + 1)(x + (a + 1)$

$(x - a - 1)(x + a + 1)$[using $a^2 - b^2 = (a + b)(a - b)$ and (a + b)^2 = a^2 + b^2 + 2ab]

Question 3: If a + b + c =0, then write the value of $a^3 + b^3 + c^3$.

Solution:

We know, $a^3 + b^3 + c^3 – 3abc = (a + b +c) (a^2 + b^2 + c^2 – ab – bc − ca)$

Put $a + b + c =0$

This implies

$a^3 + b^3 + c^3 = 3abc$

Question 4: If $a^2 + b^2 + c^2 = 20$ and $a + b + c =0$, find $ab + bc + ca$.

Solution:

We know, $(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$0 = 20 + 2(ab + bc + ca)$

$-10 = ab + bc + ca$

Or $ab + bc + ca = -10$

Question 5: If $a + b + c = 9$ and $ab + bc + ca = 40$, find $a^2 + b^2 + c^2$.

Solution:

We know, $(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

$9^2 = a^2 + b^2 + c^2 + 2(40)$

$81 = a^2 + b^2 + c^2 + 80$

$\Rightarrow a^2 + b^2 + c^2 = 1$

Chapterwise RD Sharma Solutions for Class 9 Maths :

https://www.indcareer.com/schools/rd-sharma-solutions-for-class-9-maths-chapter-5-factorization-of-algebraic-expressions/

About RD Sharma

RD Sharma i*sn't the kind of author you'd bump into at lit fests. But his bestselling books have helped many* CBSE *students lose their dread of* maths. *Sunday Times profiles the tutor turned internet star*

He dreams of algorithms that would give most people nightmares. And, spends every waking hour thinking of ways to explain concepts like 'series solution of linear differential equations'. Meet Dr Ravi Dutt Sharma — mathematics teacher and author of 25 reference books — whose name evokes as much awe as the subject he teaches. And though students have used his thick tomes for the last 31 years to ace the dreaded maths exam, it's only recently that a spoof video turned the tutor into a YouTube star.

R D Sharma had a good laugh but said he shared little with his on-screen persona except for the love for maths. "I like to spend all my time thinking and writing about maths problems. I find it relaxing," he says. When he is not writing books explaining mathematical concepts for classes 6 to 12 and engineering students, Sharma is busy dispensing his duty as vice-principal and head of department of science and humanities at Delhi government's Guru Nanak Dev Institute of Technology.