Riviera International Academy

Assignment-2077

(Shrawan 14, 2077, Wednesday)

Class: Nine

Subject- HPE

A. Short answer questions:

1. Write the importance of human resource development.
2. PQLI can be perceived as an important instrument for the measurement of development, do you agree?
3. Examine the challenges and future perspective of human resource development in the context of Nepal.

Subject- Science

1. What is the cause of chemical reaction? How does Potassium and oxyfen are combine in the form of K_2O molecule?
2. Write the valency and symbol of any ten compound radicals.
3. What is atomic radical? Write the differences between electropositive and electronegative radical in two points.
4. Write the molecular formula of the following.

   a. Sodium oxide b. Cuprous oxide c. Mercuric oxide d. Calcium nitrate

   e. Ammonium chloride f. Potassium bicarbonate

Subject- Computer

Match the following:

Group 'A'	Group 'B'
a. Motherboard	i. sequential access storage device
b. Cache memory	ii. backup storage device
c. Magnetic tape	iii. Main circuit board of a computer.
d. Hard disk	iv. high speed memory
	v. Main memory

Write the full forms of the following.

a. AT	b. ATX	c. PGA	d. SIMM
e. SATA	f. RAM	g. ROM	h. CMOS
i. POST	j. BIOS	k. DRAM	l. SRAM
m. EPROM	n. DVD	o. BIT	p. SSD

Subject- Mathematics

Source: Photo of exercise are given below

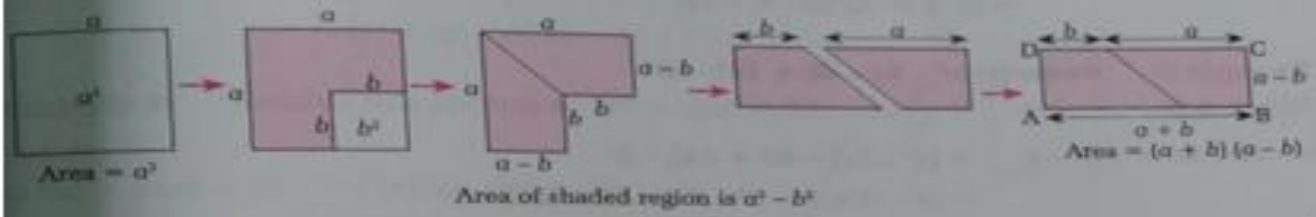
Work:

- Complete 6.1
- Complete 1 of 6.2

Do your work neatly

(ii) Expression having the difference of two squared terms (Expression of the form $a^2 - b^2$)

Let's take a square sheet of paper of length a units. From a corner of the sheet, another square of length b units is cut out.



Area of shaded region is $a^2 - b^2$

Here, area of the rectangle ABCD is $a^2 - b^2$, which is the product of length $(a + b)$ and breadth $(a - b)$

$\therefore$ length $\times$ breadth = area of rectangle

i.e. $(a + b)(a - b) = a^2 - b^2$

Here, the expression $a^2 - b^2$ is the difference of two squared terms a^2 and b^2 and it is the product of $(a + b)$ and $(a - b)$. So, $(a + b)$ and $(a - b)$ are the factors of $a^2 - b^2$.

Thus, to factorise an expression of the form $a^2 - b^2$, we should use the formula.

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

Worked-out examples

Example 1: ***Factorise*** ***(i) $8x^3y - 18xy^3$*** ***(ii) $81ax^3 - 16ax$***

Solution:

(i) $8x^3y - 18xy^3 = 2xy(4x^2 - 9y^2) = 2xy[(2x)^2 - (3y)^2]$
$= 2xy(2x + 3y)(2x - 3y)$

(ii) $81ax^3 - 16ax = ax(81x^4 - 16)$
$= ax[(9x^2)^2 - (4)^2]$
$= ax(9x^2 + 4)(9x^2 - 4)$
$= ax(9x^2 + 4)[(3x)^2 - 2^2]$
$= ax(9x^2 + 4)(3x + 2)(3x - 2)$

Example 2: ***Resolve into factorise. a) $1 - 9(a - b)^2$*** ***b) $a^2 - b^2 + 2b - 1$***

Solution:

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

b) $a^2 - b^2 + 2b - 1 = a^2 - (b^2 - 2b + 1)$

$= a^2 - (b-1)^2$ Using $(a-b)^2 = a^2 - 2ab + b^2$

$= (a + b - 1)[a - (b - 1)]$

$= (a + b - 1)(a - b + 1)$

Example 3: ***Factorise $x^2 - 6x - 40 + 14b - b^2$***

Solution:

$x^2 - 6x - 40 + 14b - b^2 = (x^2 - 6x) - 40 + 14b - b^2$

$= (x^2 - 2.x.3 + 3^2 - 3^2) - 40 + 14b - b^2$

$= (x-3)^2 - 9 - 40 + 14b - b^2$

$= (x-3)^2 - (49 - 14b + b^2)$

$= (x-3)^2 - (7^2 - 2.7.b + b^2)$

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

$= (x - 3 + 7 - b)(x - 3 - 7 + b)$

$= (x - b + 4)(x + b - 10)$

Example 4: ***Factorise $(w^2 - x^2)(y^2 - z^2) - 4wxyz$***

Solution:

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

$= (wy)^2 - 2.wxyz + (xz)^2 - (wz)^2 - 2wxyz - (xy)^2$

$= (wy)^2 - 2.wy.xz + (xz)^2 - [(wz)^2 + 2.wz.xy + (xy)^2]$

$= (wy - xz)^2 - (wz + xy)^2$

$= (wy - xz + wz + xy)(wy - xz - wz - xy)$

$= (wy + wz + xy - xz)(wy - wz - xy - xz)$

(iv) Expression of the form $a^4 + a^2b^2 + b^4$

The expressions of the form $a^4 + a^2b^2 + b^4$ are also factorised by using the sim method of factorisation of the expression of $a^2 - b^2$ form. Following formulae useful while factorising these types of expressions.

$a^2 + 2ab + b^2 = (a + b)^2 \longrightarrow$ **$a^2 + b^2 = (a + b)^2 - 2ab$**

$a^2 - 2ab + b^2 = (a - b)^2 \longrightarrow$ **$a^2 + b^2 = (a - b)^2 + 2ab$**

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

Example 5: ***Factorise a) $a^4 + a^2b^2 + b^4$ b) $x^4 - 3x^2y^2 + y^4$***

Solution:

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

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

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

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

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

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

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

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

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

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

Example 6: ***Resolve into factors a)*** $9x^4 + 14x^2 + 25$ ***b)*** $\frac{x^4}{y^4} + \frac{x^2}{y^2} + 1$ ***c)*** $a^4 + 4b^4$

Solution:

a) $9x^4 + 14x^2 + 25 = (3x^2)^2 + (5)^2 + 14x^2$

$= (3x^2 + 5)^2 - 2.3x^2.5 + 14x^2$

$= (3x^2 + 5)^2 - 16x^2$

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

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

b) $\frac{x^4}{y^4} + \frac{x^2}{y^2} + 1 = \left(\frac{x^2}{y^2}\right)^2 + (1)^2 + \frac{x^2}{y^2}$

$= \left(\frac{x^2}{y^2} + 1\right)^2 - 2.\frac{x^2}{y^2}.1 + \frac{x^2}{y^2}$

$= \left(\frac{x^2}{y^2} + 1\right)^2 - \left(\frac{x}{y}\right)^2$

$= \left(\frac{x^2}{y^2} + \frac{x}{y} + 1\right)\left(\frac{x^2}{y^2} - \frac{x}{y} + 1\right)$

c) $a^4 + 4b^4 = (a^2)^2 + (2b^2)^2$

$= (a^2 + 2b^2)^2 - 2a^2.2b^2$

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

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

EXERCISE 6.2

General section

1. Factorise:

a) $9x^2 - 4$ b) $25a^2b^2 - 1$ c) $48ax^2 - 75ay^2$ d) $x^4 - y^4$

e) $16x^5y - 81xy^5$ f) $625a^4 - 256b^4$ g) $4 - (m - n)^2$ h) $1 - (a - b)^2$

i) $16 - 25(p - q)^2$ j) $(2a - b)^2 - (a - 2b)^2$ k) $a^2 + 2ab + b^2 - c^2$ l) $p^2 - q^2 - r^2 - 2qr$

m) $a^2 - b^2 + 4b - 4$ n) $16a^4 - 4a^2 - 4a - 1$ o) $ax^2 - ay^2 - x - y$ p) $a^2 - (a - b)x - b^2$

2. Resolve into factors.

a) $x^2 + x^2y^2 + y^4$ b) $a^4 + a^2 + 1$ c) $9x^4 + 2x^2y^2 + y^4$

d) $m^4 + 4m^2n^2 + 16n^4$ e) $4x^4 - 8x^2y^2 + 49y^4$ f) $9p^4 - 34p^2q^2 + 25q^4$

g) $36y^4 - 25y^2 + 4$ h) $a^4 + 4$ i) $64x^4 + 1$

j) $100a^4 - 45a^2 + 81$ k) $169b^4 - 35b^2x^2 + 961x^4$ l) $\frac{a^4}{b^4} + \frac{a^2}{b^2} + 1$

m) $\frac{p^4}{q^4} + \frac{q^4}{p^4} + 1$ n) $\frac{x^4}{y^4} - \frac{7x^2}{y^2} + 1$ o) $\frac{b^4}{d^4} - 15\frac{b^2}{d^2} + 9$

The End.