STANDARD 7TH: CHAPTER 14

ALGEBRAIC FORMULAE

Q1. Select all correct options

1. Which of the options given below is the square of the binomial $\left(4 - \frac{1}{X}\right)^2$?
   a. $16 + \frac{8}{X} + \frac{1}{X^2}$
   b. $16 - \frac{1}{X^2}$
   c. $16 - \frac{8}{X} + \frac{1}{X^2}$
   d. $16 - \frac{8}{X} - \frac{1}{X^2}$

2. Expand $(x + 3)^2$.
   a. $x^2 + 6x + 9$
   b. $x^2 - 6x + 9$
   c. $x^2 + 9$
   d. $x^2 - 9$

3. For $x - \frac{1}{x} = 1$, find $x^2 + \frac{1}{x^2}$
   a. 3
   b. 4
   c. 5
   d. 0

4. For $x + \frac{1}{x} = 2$, find $x^4 - \frac{1}{x^4}$
   a. 0
   b. 16
   c. 8
   d. 4

5. For $x + \frac{4}{x} = 4$, then $x^2 - \frac{1}{x^2}$
   a. 16
   b. $2 < x^2 - \frac{1}{x^2} < 3$
   c. 4
   d. $\frac{15}{4}$

6. For $x + \frac{25}{x} = 10$, find $x^2 - \frac{1}{x^2}$
    a. 5
    b. $\frac{624}{25}$
    c. $\frac{24}{25}$
    d. 0

7. Find the value of 997^2 .
    a. $100^2 - 591$
    b. $100^2 - 1$
    c. $100^2 - 609$
    d. $100^2 + 609$

8. Find the value of 115^2 .
    a. $100^2 - 591$
    b. $100^2 - 1$
    c. $100^2 - 609$
    d. $100^2 + 609$

9. Find the expansion of 953^2
    a. $1000^2 + 94000 + 2209$
    b. $1000^2 - 91791$
    c. $900^2 + 95400 + 9$
    d. $1000^2 + 96209$

10. Find the value of $\frac{553^2 - 447^2}{106}$
    a. 1000
    b. 106000
    c. 106
    d. 1

Q2. Solve the followings:

1. Expand and simplify $(a + b + c)^2$

2. Expand $(2x - 3y + 2z)^2$

3. Expand $(a - b)^2 + (b - c)^2 + (c - a)^2$

4. Find the value of $\frac{974^2 - 973^2}{1947}$

5. Find the value of $(1009^2 - 1007^2) - (1008^2 - 1006^2)$

6. For a = 5, b = 7 and c = 11, find the value of $(a-b+c)^2 + (b-c+a)^2 + (c-a+b)^2$

7. Find the value $(a-b)^2 + (b-c)^2 + (c-a)^2$, given that $a-b = 7$ and $b-c = 11$.

8. Find the value of $a^2 + b^2 + c^2 + 2(ab+bc+ca)$ such that $a-b+c = 5$, $b-c+a = 7$ and $c-a+b = 11$

9. Find the value of $(a-b)^2 + (b-c)^2 + (c-a)^2$ for given $a-b-c = 5, b-c-a = 7$ and $c-a-b = 11$

10. Find the value of 873^2 using square expansion.