Algebraic Expressions and Identities Ex 6.6 Q3

Answer :

(i) Here, we will use the identity $(a + b)^2 = a^2 + 2ab + b^2$
$(102)^2 = (100 + 2)^2 = (100)^2 + 2 \times 100 \times 2 + 2^2 = 10000 + 400 + 4 = 10404$

(ii) Here, we will use the identity $(a - b)^2 = a^2 - 2ab + b^2$
$(99)^2 = (100 - 1)^2 = (100)^2 - 2 \times 100 \times 1 + 1^2 = 10000 - 200 + 1 = 9801$

(iii) Here, we will use the identity $(a + b)^2 = a^2 + 2ab + b^2$
$(1001)^2 = (1000 + 1)^2 = (1000)^2 + 2 \times 1000 \times 1 + 1^2 = 1000000 + 2000 + 1 = 1002001$

(iv) Here, we will use the identity $(a - b)^2 = a^2 - 2ab + b^2$
$(999)^2 = (1000 - 1)^2 = (1000)^2 - 2 \times 1000 \times 1 + 1^2 = 1000000 - 2000 + 1 = 998001$

(v) Here, we will use the identity $(a + b)^2 = a^2 + 2ab + b^2$
$(703)^2 = (700 + 3)^2 = (700)^2 + 2 \times 700 \times 3 + 3^2 = 490000 + 4200 + 9 = 494209$

Algebraic Expressions and Identities Ex 6.6 Q4

Answer :

Here, we will use the identity $\left(a - b \right) \left(a + b \right) = a^2 - b^2$

(i) Let us consider the following expression:

$(82)^2 - (18)^2$
$= (82 + 18)(82 - 18)$
$= 100 \times 64$
$= 6400$

(ii) Let us consider the following expression:

$(467)^2 - (33)^2$
$= (467 + 33)(467 - 33)$
$= 500 \times 434$
$= 217000$

(iii) Let us consider the following expression:

$(79)^2 - (69)^2$
$= (79 + 69)(79 - 69)$
$= 148 \times 10$
$= 1480$

(iv) Let us consider the following product:

197×203

$\because \frac{197+203}{2} = \frac{400}{2} = 200$; therefore, we will write the above product as:
197×203
$= (200-3)(200+3)$
$= (200)^2 - (3)^2$
$= 40000 - 9$
$= 39991$

Thus, the answer is 39991.

(v) Let us consider the following product:

113×87

$\because \frac{113+87}{2} = \frac{200}{2} = 100$; therefore, we will write the above product as:
113×87
$= (100+13)(100-13)$
$= (100)^2 - (13)^2$
$= 10000 - 169$
$= 9831$
Thus, the answer is 9831.

(vi) Let us consider the following product:

95×105

$\because \frac{95+105}{2} = \frac{200}{2} = 100$; therefore, we will write the above product as:
95×105
$= (100+5)(100-5)$
$= (100)^2 - (5)^2$
$= 10000 - 25$
$= 9975$

Thus, the answer is 9975.

(vii) Let us consider the following product:

1.8×2.2

$\because \frac{1.8+2.2}{2} = \frac{4}{2} = 2$; therefore, we will write the above product as:
1.8×2.2
$= (2-0.2)(2+0.2)$
$= (2)^2 - (0.2)^2$
$= 4 - 0.04$

$= 3.96$

Thus, the answer is 3.96.

(viii) Let us consider the following product:

9.8×10.2

$\because \frac{9.8+10.2}{2} = \frac{20}{2} = 10$; therefore, we will write the above product as:
9.8×10.2
$= (10 - 0.2)(10 + 0.2)$
$= (10)^2 - (0.2)^2$
$= 100 - 0.04$
$= 99.96$

Thus, the answer is 99.96.

********** END *********