Question 7. Using $a^2 - b^2 = (a + b)(a - b)$, find

(i) $51^2 - 49^2$ (ii) $(1.02)^2 - (0.98)^2$

(iii) $153^2 - 147^2$ (iv) $12.1^2 - 7.9^2$

Solution:

(i) $51^2 - 49^2 = (51 + 49)(51 - 49) = 100 \times 2 = 200$

Question 8. Using $(x + a)(x + b) = x^2 + (a + b)x + ab$, find

(i) 103×104 (ii) 5.1×5.2

(iii) 103×98 (iv) 9.7×9.8

Solution:

(i) $103 \times 104 = (100 + 3)(100 + 4)$

$= (100)^2 + (3 + 4)(100) + 3 \times 4$

$= 10000 + 700 + 12$

$= 10712$

Question 18.Verify that $(11pq + 4q)^2 - (11pq - 4q)^2 = 176pq^2$

Solution: LHS $= (11pq + 4q)^2 - (11pq - 4q)^2$

$= (11pq + 4q + 11pq - 4q) \times (11pq + 4q - 11pq + 4q)$

[using $a^2 - b^2 = (a - b)(a + b)$,

here $a = 11pq + 4q$ and $b = 11pq - 4q$]

$= (22pq)(8q)$

$= 176\, pq^2$

= RHS.

Hence Verified.

Question 19.Find the value of $38^2-22^2/16$, using a suitable identity. (NCERT Exemplar)

Solution:

Since $a^2 - b^2 = (a + b)(a - b)$, therefore

$$38^2 - 22^2 = (38 - 22)(38 + 22)$$
$$= 16 \times 60$$

So, $$\frac{38^2 - 22^2}{16} = \frac{16 \times 60}{16}$$
$$= 60$$

Question 20. Find the value of x, if $10000x = (9982)^2 - (18)^2$ (NCERT Exemplar)

Solution:

RHS = $(9982)^2 - (18)^2$

= $(9982 + 18)(9982 - 18)$

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

= $(10000) \times (9964)$

LHS = $(10000) \times x$

Comparing L.H.S. and RHS, we get

$10000x = 10000 \times 9964$

$x = 9964$