Algebraic Expressions and Identities Ex 6.6 Q5

Answer :

(i) Let us consider the following expression:

$\frac{58^2-42^2}{16}$

Using the identity $(a+b)(a-b)=a^2-b^2$, we get:

$\frac{58^2-42^2}{16}=\frac{(58+42)(58-42)}{16}$

$\Rightarrow \frac{58^2-42^2}{16}=\frac{100\times 16}{16}$

$\Rightarrow \frac{58^2-42^2}{16}=100$

Thus, the answer is 100.

(ii) Let us consider the following expression:

$178\times 178-22\times 22$

Using the identity $(a+b)(a-b)=a^2-b^2$, we get:

$178\times 178-22\times 22=178^2-22^2=(178+22)(178-22)=200\times 156=31200$

Thus, the answer is 31200.

(iii) Let us consider the following expression:

$\frac{198\times 198-102\times 102}{96}=\frac{198^2-102^2}{96}$

Using the identity $(a+b)(a-b)=a^2-b^2$, we get:

$\frac{198\times 198-102\times 102}{96}=\frac{198^2-102^2}{96}=\frac{(198+102)(198-102)}{96}$

$\Rightarrow \frac{198\times 198-102\times 102}{96}=\frac{(198+102)(198-102)}{96}$

$\Rightarrow \frac{198\times 198-102\times 102}{96}=\frac{300\times 96}{96}$

$\Rightarrow \frac{198\times 198-102\times 102}{96}=300$

Thus, the answer is 300.

(iv) Let us consider the following expression:

$1.73\times 1.73-0.27\times 0.27$

Using the identity $(a+b)(a-b)=a^2-b^2$, we get:

$1.73\times 1.73-0.27\times 0.27=1.73^2-0.27^2=(1.73+0.27)(1.73-0.27)=2\times 1.46$

$=2.92$

Thus, the answer is 2.92.

(v) Let us consider the following expression:

$\frac{8.63\times8.63-1.37\times1.37}{0.726}=\frac{8.63^2-1.37^2}{0.726}$

Using the identity $(a+b)(a-b)=a^2-b^2$, we get:

$$\frac{8.63\times8.63-1.37\times1.37}{0.726}=\frac{8.63^2-1.37^2}{0.726}=\frac{(8.63+1.37)(8.63-1.37)}{0.726}$$
$$\Rightarrow \frac{8.63\times8.63-1.37\times1.37}{0.726}=\frac{(8.63+1.37)(8.63-1.37)}{0.726}$$
$$\Rightarrow \frac{8.63\times8.63-1.37\times1.37}{0.726}=\frac{(8.63+1.37)(8.63-1.37)}{0.726}$$
$$\Rightarrow \frac{8.63\times8.63-1.37\times1.37}{0.726}=\frac{10\times7.26}{0.726}$$
$$\Rightarrow \frac{8.63\times8.63-1.37\times1.37}{0.726}=\frac{10\times \cancel{7.26}^{10}}{\cancel{0.726}}$$
$$\Rightarrow \frac{8.63\times8.63-1.37\times1.37}{0.726}=100$$

Thus, the answer is 100.

Algebraic Expressions and Identities Ex 6.6 Q6

Answer :

(i) Let us consider the following equation:

$$4x=(52)^2-(48)^2$$

Using the identity $(a+b)(a-b)=a^2-b^2$, we get:

$$4x=(52)^2-(48)^2$$
$$4x=(52+48)(52-48)$$
$$4x=100\times4=400$$
$$\Rightarrow 4x=400$$
$$\Rightarrow x=100$$ (Dividing both sides by 4)

(ii) Let us consider the following equation:

$$14x=(47)^2-(33)^2$$

Using the identity $(a+b)(a-b)=a^2-b^2$, we get:

$$14x=(47)^2-(33)^2$$
$$14x=(47+33)(47-33)$$
$$14x=80\times14=1120$$
$$\Rightarrow 14x=1120$$
$$\Rightarrow x=80$$ (Dividing both sides by 14)

(iii) Let us consider the following equation:

$5x = (50)^2 - (40)^2$

Using the identity $(a+b)(a-b) = a^2 - b^2$, we get:

$5x = (50)^2 - (40)^2$

$5x = (50+40)(50-40)$

$5x = 90 \times 10 = 900$

$\Rightarrow 5x = 900$

$\Rightarrow x = 180$ (Dividing both sides by 5)

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