Algebraic Identities Ex 4.2 Q3

Answer :

In the given problem, we have to find value of $ab+bc+ca$

Given $a+b+c=0$ and $a^2+b^2+c^2=16$

Squaring the equation $a+b+c=0$, we get

$$(a+b+c)^2=(0)^2$$

$$a^2+b^2+c^2+2ab+abc+2ca=0$$

Now putting the value of $a^2+b^2+c^2=16$ in above equation we get,

$$16+2ab+2bc+2ca=0$$

$$2ab+2bc+2ca=-16$$

Taking 2 as common factor we get

$$2(ab+bc+ca)=-16$$

$$ab+bc+ca=\frac{-16}{2}$$

$$ab+bc+ca=-8$$

Hence the value of $ab+bc+ca$ is $\boxed{ab+bc+ca=-8}$.

Algebraic Identities Ex 4.2 Q4

Answer :

In the given problem, we have to find value of $a+b+c$

Given $a^2+b^2+c^2=16, ab+bc+ca=10$

Multiply equation $ab+bc+ca=10$ with 2 on both sides we get,

$$2(ab+bc+ca)=2\times10$$

$$2ab+2bc+2ca=20$$

Now adding both equation $a^2+b^2+c^2=16$ and $2ab+2bc+2ca=20$ we get

$$a^2+b^2+c^2+2ab+2bc+2ca=20+16$$

$$a^2+b^2+c^2+2ab+2bc+2ca=36$$

We shall use the identity $(x+y+z)^2=x^2+y^2+z^2+2xy+2yz+2zx$

$$(a+b+c)^2=36$$

$$a+b+c=\sqrt{36}$$

$$a+b+c=\pm6$$

Hence the value of $a+b+c$ is $\boxed{\pm6}$.

Algebraic Identities Ex 4.2 Q5

Answer :

In the given problem, we have to find value of $a^2+b^2+c^2$

Given $a+b+c=9, ab+bc+ca=23$

Squaring both sides of $a+b+c=9$ we get,

$$(a+b+c)^2=(9)^2$$

$$a^2+b^2+c^2+2ab+2bc+2ca=81$$

$$a^2+b^2+c^2+2(ab+bc+ca)=81$$

Substituting $ab+bc+ca=23$ in above equation we get,

$$a^2+b^2+c^2+2(23)=81$$

$$a^2+b^2+c^2+46=81$$

$$a^2+b^2+c^2=81-46$$

$$a^2+b^2+c^2=35$$

Hence the value of $a^2+b^2+c^2$ is $\boxed{35}$.

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