Exercise 6E

Q11

Answer :

(c) $(a^4 - 1)$

$(i)\ (a+1)(a-1)(a^2+1)$

$\Rightarrow \left((a)^2 - (1)^2\right)(a^2+1)$ $\left[\text{according to the formula } a^2 - b^2 = (a+b)(a-b)\right]$

$\Rightarrow (a^2-1)(a^2+1)$

$\Rightarrow (a^2)^2 - \left(1^2\right)^2$ $\left[\text{according to the formula } a^2 - b^2 = (a+b)(a-b)\right]$

$\Rightarrow a^4 - 1$

Q12

Answer :

a) $\left(\frac{1}{x^2} - \frac{1}{y^2}\right)$

$\left(\frac{1}{x} + \frac{1}{y}\right)\left(\frac{1}{x} - \frac{1}{y}\right)$

$\Rightarrow$ *According to the formula* $(a+b)(a-b) = (a)^2 - (b)^2$:

$\Rightarrow \left(\frac{1}{x^2} - \frac{1}{y^2}\right)$

Q13

Answer :

(c) 23

$$\left(x + \frac{1}{x}\right) = 5$$

$\Rightarrow$ ***Squaring both the sides :***

$$\Rightarrow \left(x + \frac{1}{x}\right)^2 = (5)^2$$

$$\Rightarrow \left(x^2 + \frac{1}{x^2} + 2(x)\left(\frac{1}{x}\right)\right) = 25$$

$$\Rightarrow \left(x^2 + \frac{1}{x^2}\right) + 2 = 25$$

$$\Rightarrow \left(x^2 + \frac{1}{x^2}\right) = 25 - 2$$

$$\Rightarrow \left(x^2 + \frac{1}{x^2}\right) = 23$$

$\Rightarrow \left(x^2 + \frac{1}{x^2}\right) = 25$

Q14

Answer :

(b) 38

$\left(x - \frac{1}{x}\right) = 6$

$\Rightarrow$ *Squaring both the sides* :

$\Rightarrow \left(x - \frac{1}{x}\right)^2 = (6)^2$

$\Rightarrow \left(x^2 + \frac{1}{x^2} - 2(x)\left(\frac{1}{x}\right)\right) = 36$

$\Rightarrow \left(x^2 + \frac{1}{x^2}\right) - 2 = 36$

$\Rightarrow \left(x^2 + \frac{1}{x^2}\right) = 36 + 2$

$\Rightarrow \left(x^2 + \frac{1}{x^2}\right) = 38$

Q15

Answer :

(c) 6400

$(82)^2 - (18)^2$ [using the identity $(a-b)(a+b)=a^2-b^2$]
$= (82 + 18)(82 - 18)$
$= (100)(64)$
$= 6400$

Q16

Answer :

(a) 39991

$(197) \times (203)$ [using the identity $(a+b)(a-b) = a^2 - b^2$]
$\Rightarrow (200 - 3)(200 + 3)$
$\Rightarrow (200)^2 - (3)^2$
$\Rightarrow 40000 - 9$
$\Rightarrow 39991$

Q17

Answer :

(b) 116

$$(a+b) = 12$$
$$\Rightarrow \textit{Squaring both the sides :}$$
$$\Rightarrow (a+b)^2 = (12)^2$$
$$\Rightarrow \left(a^2 + b^2 + 2ab\right) = 144$$
$$\Rightarrow \left(a^2 + b^2\right) = 144 - 2ab$$
$$\Rightarrow \left(a^2 + b^2\right) = 144 - 2(14)$$
$$\Rightarrow \left(a^2 + b^2\right) = 144 - 28$$
$$\Rightarrow \left(a^2 + b^2\right) = 116$$

Q18

Answer :

(a) 67

$$(a-b) = 7$$

$\Rightarrow$ Squaring both the sides :

$$\Rightarrow (a-b)^2 = (7)^2$$

$$\Rightarrow \left(a^2 + b^2 - 2ab\right) = 49$$

$$\Rightarrow \left(a^2 + b^2\right) = 49 + 2ab$$

$$\Rightarrow \left(a^2 + b^2\right) = 49 + 2(9)$$

$$\Rightarrow \left(a^2 + b^2\right) = 49 + 18$$

$$\Rightarrow \left(a^2 + b^2\right) = 67$$

Q19

Answer :

(c) 625

$$\left(4x^2+20x+25\right)$$

$$\Rightarrow (2x)^2+2(2x)(5)+(5)^2$$

$$\Rightarrow (2x+5)^2$$

$$\Rightarrow (2(10)+5)^2$$

$$\Rightarrow (20+5)^2$$

$$\Rightarrow (25)^2$$

$$\Rightarrow 625$$

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