Exercise 6D

(ii)

$$(128)^2 - (72)^2$$
$$= (128 - 72)(128 + 72)$$
$$= (56)(200)$$
$$= 11200$$

(iii)

$$197 \times 203$$
$$= \left(200 - 3\right)\left(200 + 3\right)$$
$$= (200)^2 - (3)^2$$
$$= 40000 - 9$$
$$= 39991$$

(iv)

$$\frac{198 \times 198 - 102 \times 102}{96}$$
$$= \frac{(198)^2 - (102)^2}{96}$$
$$= \frac{(198 - 102)(198 + 102)}{96}$$
$$= \frac{(96)(300)}{}$$

96

$$= 300$$

(v)

$$(14.7 \times 15.3)$$
$$= (15 - 0.3) \times (15 + 0.3)$$
$$= (15)^2 - (0.3)^2$$
$$= 225 - 0.09$$
$$= 224.91$$

(vi)

$(8.63)^2 - (1.37)^2$
$= (8.63 - 1.37)(8.63 + 1.37)$
$= (7.26)(10)$
$= 72.6$

Q8

Answer :

$(9x^2 + 24x + 16)$
$Given, x = 12$
$\Rightarrow (3x)^2 + 2(3x)(4) + (4)^2$
$\Rightarrow (3x + 4)^2$
$\Rightarrow (3(12) + 4)^2$
$\Rightarrow (36 + 4)^2$
$\Rightarrow (40)^2 = 1600$

Therefore, the value of the expression ($9x^2 + 24x + 16$), when $x = 12$, is 1600.

Q9

Answer :

$(64x^2 + 81y^2 + 144xy)$
$Given :$
$x = 11$
$y = \frac{4}{3}$

$\Rightarrow (8x)^2 + (9y)^2 + 2(8x)(9y)$
$\Rightarrow (8x + 9y)^2$
$\Rightarrow \left(8\left(11\right) + 9\left(\frac{4}{3}\right)\right)^2$
$\Rightarrow (88 + 12)^2$
$\Rightarrow (100)^2$
$\Rightarrow 10000$

Therefore, the value of the expression ($64x^2 + 81y^2 + 144xy$), when $x = 11$ and $y = \frac{4}{3}$, is 10000.

Q10

Answer :

$(36x^2 + 25y^2 - 60xy)$
$\Rightarrow x = \frac{2}{3}, y = \frac{1}{5}$
$= (6x)^2 + (5y)^2 - 2(6x)(5y)$
$= (6x - 5y)^2$
$= \left(6\left(\frac{2}{3}\right) - 5\left(\frac{1}{5}\right)\right)^2$
$= (4 - 1)^2$
$= (3)^2$
$\Rightarrow 9$

Q10

Answer :

$(36x^2 + 25y^2 - 60xy)$
$\Rightarrow x = \frac{2}{3}, y = \frac{1}{5}$
$= (6x)^2 + (5y)^2 - 2(6x)(5y)$
$= (6x - 5y)^2$
$= \left(6\left(\frac{2}{3}\right) - 5\left(\frac{1}{5}\right)\right)^2$
$= (4 - 1)^2$
$= (3)^2$
$\Rightarrow 9$

Q11

Answer :

$(i) \quad \left(x + \frac{1}{x}\right) = 4$

Squaring both the sides :

$$\Rightarrow \left(x+\frac{1}{x}\right)^2 = (4)^2$$

$$\Rightarrow \left(x^2+\frac{1}{x^2}+2(x)\left(\frac{1}{x}\right)\right) = 16$$

$$\Rightarrow \left(x^2+\frac{1}{x^2}\right)+2 = 16$$

$$\Rightarrow \left(x^2+\frac{1}{x^2}\right) = 16-2$$

$$\Rightarrow \left(x^2+\frac{1}{x^2}\right) = 14$$

Therefore, the value of $x^2+\frac{1}{x^2}$ is 14.

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