



SHIKSHA CLASSES

Sub. : Maths
Std. : VIIIth(CBSE)

Answer Paper
12: Factorisation

Marks : 30

Section A (Each 1 Mark)

Select the most appropriate answer from the given options (MCQ'S - Q.1 to Q.5)

Q.1 : The common factor of $2a^2b^4c^2$, $8a^4b^3c^4$ and $6a^3b^3c^2$ is

Ans : a) $2a^2b^3c^2$

Q.2 : The factorisation of $28a^3b^5 - 42a^5b^3$ is

Ans : a) $14a^3b^3(2b^2-3a^2)$

Q.3 : The factorisation of $ab - a - b + 1$ is

Ans : a) $(a - 1)(b - 1)$

Q.4 : The value of :

$$\frac{0.564 \times 0.564 - 0.436 \times 0.436}{0.564 - 0.436}$$

Ans : b) 1

Q.5 : The factorisation of $6x^2 - 5x - 6$ is

Ans : a) $(2x - 3)(3x + 2)$

Fill in the blank. (Q.6 to Q.7)

Q.6 : The greatest common factor of $5a$ and $15b$ is _____

Ans : 5

Q.7 : The quotient obtained on dividing $(x^2 - 1)(x - 2)$ by $-(x - 2)$ is _____

Ans : $-(x^2 - 1)$

Write whether the following statements are

True or False. (Q.8 to Q.9)

Q.8 : The difference of the square of two consecutive natural numbers is equal to their sum.

Ans : True

Q.9 : An identity is true for all values of its variables.

Ans : True

Section B (Each 2 Marks)

Q.10 : Factorise : $-4a^2 + 4ab - 4ca$

Ans : $4a^2 = 2 \times 2 \times a \times a$

$$4ab = 2 \times 2 \times a \times b$$

$$4ca = 2 \times 2 \times c \times a$$

$$\therefore -4a^2 + 4ab - 4ca$$

$$= (-1) \times 2 \times 2 \times a \times a + 2 \times 2 \times a \times b$$

$$+ (-1) \times 2 \times 2 \times c \times a$$

$$= 2 \times 2 \times a [(-1) \times a + b + (-1) \times c]$$

(using distributive law)

$$= 4a(-a + b - c)$$

This is required factor

OR

Factorise : $x^2yz + xy^2z + xyz^2$

Ans : $x^2yz = x \times x \times y \times z$

$$xy^2z = x \times y \times y \times z$$

$$xyz^2 = x \times y \times z \times z$$

$$\begin{aligned} &\therefore x^2yz + xy^2z + xyz^2 \\ &= x \times x \times y \times z + x \times y \times y \times z + x \times y \\ &\quad \times z \times z \\ &= x \times y \times z(x + y + z) \\ &\text{(using distributive law)} \\ &= xyz(x + y + z) \end{aligned}$$

Q.11 : Find the common factors of the given terms

(i) 14pq, 28p²q² (ii) 10pq, 20qr, 30rp

Ans : (i) 14pq, 28p²q²

$$\begin{aligned} 14pq &= 2 \times 7 \times p \times q \\ 28p^2q^2 &= 2 \times 2 \times 7 \times p \times p \times q \times q \\ \text{Common factors are } &2, 7, p \text{ and } q \end{aligned}$$

\therefore Required common factor

$$\begin{aligned} &= 2 \times 7 \times p \times q \\ &= 14pq \end{aligned}$$

ii) 10pq, 20qr, 30rp

$$\begin{aligned} 10pq &= 2 \times 5 \times p \times q \\ 20qr &= 2 \times 2 \times 5 \times q \times r \\ 30rp &= 2 \times 3 \times 5 \times r \times p \end{aligned}$$

Common factor are 2 and 5.

\therefore Required common factor = $2 \times 5 = 10$

Section C (3 Marks Each)

Q.12 : Factorise : $(\ell + m)^2 - 4\ell m$

Ans : $(\ell + m)^2 - 4\ell m$

$$\begin{aligned} &= (\ell^2 + 2\ell m + m^2) - 4\ell m \\ &\text{(using } (a + b)^2 = a^2 + 2ab + b^2) \end{aligned}$$

$$= \ell^2 (2\ell m - 4\ell m) + m^2$$

$$= \ell^2 - 2\ell m + m^2$$

(combining the like terms)

$$= (\ell^2) - 2(\ell)(m) + (m)^2$$

$$= (\ell - m)^2$$

$$\text{(using } a^2 - 2ab + b^2 = (a - b)^2)$$

$$= (\ell - m)(\ell - m)$$

It is required factor form.

OR

Factorise : $16x^5 - 144x^2$

Ans : $16x^5 - 144x^2$

$$= (16)^3 (x^2 - 9) \text{ (Taking } 16^3 \text{ common)}$$

$$= (16)^3 \{(x)^2 - (-3)^2\}$$

$$= (16)^3 (x - 3)(x + 3)$$

(using Identify $a^2 - b^2 = (a + b)(a - b)$)

It is the required factor form

Q.13 : Factorise : $p^2 + 6p + 8$

Ans : $p^2 + 6p + 8$

$$= p^2 + 6p + 9 - 1$$

$$= \{(p)^2 + 2 \times p \times 3 + (3)^2\} - (1)^2$$

$$= (p + 3)^2 - (1)^2$$

(using identify $(a + b)^2 = a^2 + 2ab + b^2$)

$$= (p + 3 + 1)(p + 3 - 1)$$

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

$$= (p + 4)(p + 2)$$

It is required factor form.

Q.14 : Factorise the expression and divide them as directed.

$$(y^2 + 7y + 10) \div (y + 5)$$

Ans : $= \frac{y^2 + 7y + 10}{y + 5}$

$$= \frac{y^2 + 2y + 5y + 10}{y + 5}$$

$$\begin{aligned} & \text{(using } (x+a)(x+b) \\ & = (x)^2 + (a+b)x + ab \\ & = \frac{y(y+2) + 5(y+2)}{y+5} \end{aligned}$$

$$= \frac{(y+2)(y+5)}{(y+5)}$$

taking $(y+2)$ common

$$= \frac{y+2}{1} = y+2$$

This is required answer.

Section D (4 Marks Each)

Q.15 : Factorise : $x^4 - (y+z)^4$

Ans : $= x^4 - (y+z)^4$

$$= (x^2)^2 - \{(y+z)^2\}^2$$

$$= \{x^2 + (y+z)^2\} \{x^2 - (y+z)^2\}$$

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

$$= \{x^2 + (y+z)^2\} (x+y+z) (x-(y+z))$$

again using $a^2 - b^2 = (a+b)(a-b)$

$$= (x-y-z)(x+y+z) \{x^2 + (y+z)^2\}$$

It is the required factor form.

OR

Divide as directed : $20(y+4)(y^2+5y+3) \div 5(y+4)$

Ans : $20(y+4)(y^2+5y+3) \div 5(y+4)$

$$= \frac{20(y+4)(y^2+5y+3)}{5(y+4)}$$

$$= \frac{2 \times 2 \times 5(y+4)(y^2+5y+3)}{5(y+4)}$$

$$= 2 \times 2 \times (y^2+5y+3)$$

$$= 4(y^2+5y+3)$$

It is the required factor form.

Q.16 : Factorise the expression and divide them as directed.

$39y^3(50y^2+98) \div 26y^2(5y+7)$

Ans : $39y^3(50y^2+98) \div 26y^2(5y+7)$

$$= \frac{39y^3(50y^2-98)}{26y^2(5y+7)}$$

$$= \frac{3 \times 13 \times y^3 \times 2 \times (25y^2-49)}{2 \times 13 \times y^2(5y+7)}$$

taking 2 common

$$= \frac{3y\{(5y)^2 - (7)^2\}}{(5y+7)}$$

$$= \frac{3y(5y+7)(5y-7)}{(5y+7)}$$

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

$$= \frac{3y(5y-7)}{1}$$

$$= 3y(5y-7)$$
