General instructions for Students: *Whatever be the notes provided, everything must*

be copied in the Mathematics copy and then do the HOMEWORK in the same copy.

CLASS − VIII   *MATHEMATICS*

ALGEBRAIC EXPRESSIONS AND IDENTITIES

Multiplication of two or more monomials   *EXERCISE 10.2*

1. *Find the product of* :

(*i*) $4x^3$ *and* $-3xy$

Solution : $(4x^3) \times (-3xy) = \{4 \times (-3)\} \times \{(x^3) \times (xy)\}$

$$= -12 \times (x^3 \times x) \times (y)$$

$$= -12\, x^4 y \qquad \textit{Ans.}$$

(*v*) $-\frac{1}{2}x^2, \quad -\frac{3}{5}xy, \quad \frac{2}{3}yz \quad and \quad \frac{5}{7}xyz$

Solution : $\left(-\frac{1}{2}x^2\right) \times \left(-\frac{3}{5}xy\right) \times \left(\frac{2}{3}yz\right) \times \left(\frac{5}{7}xyz\right)$

$$= \{\left(-\frac{1}{2}\right) \times \left(-\frac{3}{5}\right) \times \left(\frac{2}{3}\right) \times \left(\frac{5}{7}\right)\} \times (x^2 \times x \times x) \times (y \times y \times y) \times (z \times z)$$

$$= \frac{1}{7}x^4 y^3 z^2 \quad \textit{Ans.}$$

Multiplication of a polynomial by a monomials

2. *Multiply* :

(*ii*) $(2p^2 - 3pq + 5q^2 + 5)$ *by* $-2pq$

Solution : $(2p^2 - 3pq + 5q^2 + 5) \times (-2pq)$

$= \{(2p^2) \times (-2pq)\} - \{(3pq) \times (-2pq)\} + \{(5q^2) \times (-2pq)\} + \{(5) \times (-2pq)\}$

$= -4p^3 q + 6p^2 q^2 - 10pq^3 - 10pq \qquad \textit{Ans.}$

(*iii*) $\left(\frac{2}{3}a^2 b - \frac{4}{5}ab^2 + \frac{2}{7}ab + 3\right)$ *by* $35ab$

Solution : $\left\{\left(\frac{2}{3}a^2 b\right) \times (35ab)\right\} - \left\{\left(\frac{4}{5}ab^2\right) \times (35ab)\right\} + \left\{\left(\frac{2}{7}ab\right) \times (35ab)\right\} + (3 \times 35ab)$

$$= \frac{70}{3}a^3 b^2 - 28a^2 b^3 + 10a^2 b^2 + 105ab \qquad \textit{Ans.}$$

5. *Simplify the expression and evaluate them directed* :

(ii) $5xy\,(3x + 4y - 7) - 3y(xy - x^2 + 9) - 8$ *for* $x = 2,\ y = -1$

Solution : $\quad 5xy\,(3x + 4y - 7) - 3y(xy - x^2 + 9) - 8$

$$= 15x^2y + 20xy^2 - 35xy - 3xy^2 + 3x^2y - 27y - 8$$

$$= 18x^2y + 17xy^2 - 35xy - 27y - 8$$

$$= 18(2)^2(-1) + 17(2)(-1)^2 - 35(2)(-1) - 27(-1) - 8 \quad [\,x = 2,\ y = -1\,]$$

$$= -72 + 34 + 70 + 27 - 8 \ = \ 131 - 80 \ = \ 51 \qquad Ans.$$

7. *Subtract* :

(ii) $\quad 7xy(x^2 - 2xy + 3y^2) - 8x(x^2y - 4xy + 7xy^2)$ *from* $3y(4x^2y - 5xy + 8xy^2)$

Solution : $7xy(x^2 - 2xy + 3y^2) - 8x(x^2y - 4xy + 7xy^2)$

$$= 7x^3y - 14x^2y^2 + 21xy^3 - 8x^3y + 32x^2y - 56x^2y^2$$

$$= -x^3y - 70x^2y^2 + 21xy^3 + 32x^2y$$

$$3y(4x^2y - 5xy + 8xy^2) \ = \ 12x^2y^2 - 15xy^2 + 24xy^3$$

***By Column Method*:**

$12x^2y^2$	$-\ 15xy^2$	$+\ \ 24xy^3$		
$-\ 70x^2y^2$		$+\ 21xy^3$	$-\ x^3y$	$+\ 32x^2y$
$(+)$		$(-)$	$(+)$	$(-)$
$82x^2y^2$	$-\ 15xy^2$	$+\ \ 3xy^3$	$+\ x^3y$	$-\ 32x^2y\quad$ *Ans.*

Multiplication of a polynomial by a polynomial

1. *Multiply* : (iv) $(2x^2 + 3)$ *by* $(3x - 5)$

Solution : $(2x^2 + 3) \times (3x - 5) = 2x^2 \times (3x - 5) + 3 \times (3x - 5)$

$$= 6x^3 - 10x^2 + 9x - 15 \quad Ans.$$

2. *Multiply* : (ii) $(3 - 5x + 2x^2)$ *by* $(4x - 5)$

Solution :

	$2x^2$	$-$	$5x$	$+$	3				Arranging the terms of the given
$4x$	$-$	5							polynomial in descending powers
$8x^3$	$-$	$20x^2$	$+$	$12x$					of x and then multiplying

$$
\begin{array}{rrrrr}
2x^2 & - & 5x & + & 3 \\
 & & 4x & - & 5 \\
\hline
8x^3 & - & 20x^2 & + & 12x \\
 & & 10x^2 & + 25x & - 15 \\
\hline
8x^3 & - & 10x^2 & + 37x & - 15 \quad Ans.
\end{array}
$$

3. *Multiply* : (ii) $(2 - 3y - 5y^2)$ *by* $(2y - 1 + 3y^2)$

Solution :

$$
\begin{array}{rrrrrr}
-5y^2 & - & 3y & + & 2 \\
3y^2 & + & 2y & - & 1 \\
\hline
-15y^4 & - & 9y^3 & + & 6y^2 \\
 & - & 10y^3 & - & 6y^2 & + 4y \\
 & & & & 5y^2 & + 3y & - 2 \\
\hline
-15y^4 & - & 19y^3 & + & 5y^2 & + 7y & - 2 \quad Ans.
\end{array}
$$

HOME WORK   *EXERCISE — 10.3*

QUESTION NUMBERS : 1 (i), (iii), (v) *and* 3(i)