Algebraic Expressions and Identities Ex 6.2 Q2

Answer :

(i) $12xy-(-5xy)$
$=12xy+5xy$
$=17xy$

(ii) $-7a^2-(2a^2)$
$=-7a^2-2a^2$
$=-9a^2$

(iii) $(3a-5b)-(2a-b)$
$=(3a-5b)-2a+b$
$=3a-5b-2a+b$
$=3a-2a-5b+b$
$=a-4b$

(iv) $(4x^3+x^2+x+6)-(2x^3-4x^2+3x+5)$
$=4x^3+x^2+x+6-2x^3+4x^2-3x-5$
$=4x^3-2x^3+x^2+4x^2+x-3x+6-5$ (Collecting like terms)
$=2x^3+5x^2-2x+1$ (Combining like terms)

(v) $\left(\frac{1}{3}y^3+\frac{5}{7}y^2+y-2\right)-\left(\frac{2}{3}y^3-\frac{2}{7}y^2-5\right)$
$=\frac{1}{3}y^3+\frac{5}{7}y^2+y-2-\frac{2}{3}y^3+\frac{2}{7}y^2+5$
$=\frac{1}{3}y^3-\frac{2}{3}y^3+\frac{5}{7}y^2+\frac{2}{7}y^2+y-2+5$ (Collecting like terms)
$=-\frac{1}{3}y^3+y^2+y+3$ (Combining like terms)

(vi) $\left(\frac{2}{3}x+\frac{3}{2}y-\frac{4}{3}z\right)-\left(\frac{3}{2}x-\frac{5}{4}y-\frac{7}{2}z\right)$
$=\frac{2}{3}x+\frac{3}{2}y-\frac{4}{3}z-\frac{3}{2}x+\frac{5}{4}y+\frac{7}{2}z$
$=\frac{2}{3}x-\frac{3}{2}x+\frac{3}{2}y+\frac{5}{4}y-\frac{4}{3}z+\frac{7}{2}z$ (Collecting like terms)
$=-\frac{5}{6}x+\frac{11}{4}y+\frac{13}{6}z$ (Combining like terms)

(vii) $\left(\frac{2}{3}x^2y+\frac{3}{2}xy^2-\frac{1}{3}xy\right)-\left(x^2y-\frac{4}{5}xy^2+\frac{4}{3}xy\right)$
$=\frac{2}{3}x^2y+\frac{3}{2}xy^2-\frac{1}{3}xy-x^2y+\frac{4}{5}xy^2-\frac{4}{3}xy$
$=\frac{2}{3}x^2y-x^2y+\frac{3}{2}xy^2+\frac{4}{5}xy^2-\frac{1}{3}xy-\frac{4}{3}xy$ (Collecting like terms)
$=-\frac{1}{3}x^2y+\frac{23}{10}xy^2-\frac{5}{3}xy$ (Combining like terms)

(viii) $\left(\frac{3}{5}bc-\frac{4}{5}ac\right)-\left(\frac{ab}{7}-\frac{35}{3}bc+\frac{6}{5}ac\right)$
$=\frac{3}{5}bc-\frac{4}{5}ac-\frac{ab}{7}+\frac{35}{3}bc-\frac{6}{5}ac$
$=\frac{3}{5}bc+\frac{35}{3}bc-\frac{4}{5}ac-\frac{6}{5}ac-\frac{ab}{7}$ (Collecting like terms)
$=\frac{184}{15}bc-2ac-\frac{ab}{7}$ (Combining like terms)

Algebraic Expressions and Identities Ex 6.2 Q3

Answer :

(i) The difference is given by:

$$\left(\frac{x^3}{3}-\frac{5}{2}x^2+\frac{3}{5}x+\frac{1}{4}\right)-\left(\frac{6}{5}x^2-\frac{4}{5}x^3+\frac{5}{6}+\frac{3}{2}x\right)$$
$$=\frac{x^3}{3}-\frac{5}{2}x^2+\frac{3}{5}x+\frac{1}{4}-\frac{6}{5}x^2+\frac{4}{5}x^3-\frac{5}{6}-\frac{3}{2}x$$
$$=\frac{x^3}{3}+\frac{4}{5}x^3-\frac{5}{2}x^2-\frac{6}{5}x^2+\frac{3}{5}x-\frac{3}{2}x+\frac{1}{4}-\frac{5}{6} \quad \text{(Collecting like terms)}$$
$$=\left(\frac{5+12}{15}\right)x^3+\left(\frac{-25-12}{10}\right)x^2+\left(\frac{6-15}{10}\right)x+\left(\frac{6-20}{24}\right)$$
$$=\frac{17}{15}x^3-\frac{37}{10}x^2-\frac{9}{10}x-\frac{7}{12} \quad \text{(Combining like terms)}$$

(ii) The difference is given by:

$$\left(\frac{1}{3}a^3-\frac{3a^2}{4}-\frac{5}{2}\right)-\left(\frac{5a^2}{2}+\frac{3a^3}{2}+\frac{a}{3}-\frac{6}{5}\right)$$
$$=\frac{1}{3}a^3-\frac{3a^2}{4}-\frac{5}{2}-\frac{5a^2}{2}-\frac{3a^3}{2}-\frac{a}{3}+\frac{6}{5}$$
$$=\frac{1}{3}a^3-\frac{3a^3}{2}-\frac{3a^2}{4}-\frac{5a^2}{2}-\frac{a}{3}-\frac{5}{2}+\frac{6}{5} \quad \text{(Collecting like terms)}$$
$$=\left(\frac{2-9}{6}\right)a^3+\left(\frac{-3-10}{4}\right)a^2-\frac{a}{3}+\left(\frac{-25+12}{10}\right)$$
$$=-\frac{7}{6}a^3-\frac{13}{4}a^2-\frac{a}{3}-\frac{13}{10} \quad \text{(Combining like terms)}$$

(iii) The difference is given by:

$$\left(\frac{7}{2}-\frac{x}{3}-\frac{x^2}{5}\right)-\left(\frac{7x^3}{4}+\frac{3x^2}{5}+\frac{x}{2}+\frac{9}{2}\right)$$
$$=\frac{7}{2}-\frac{x}{3}-\frac{x^2}{5}-\frac{7x^3}{4}-\frac{3x^2}{5}-\frac{x}{2}-\frac{9}{2}$$
$$=\frac{7}{2}-\frac{9}{2}-\frac{x}{3}-\frac{x}{2}-\frac{x^2}{5}-\frac{3x^2}{5}-\frac{7x^3}{4} \quad \text{(Collecting like terms)}$$
$$=\left(\frac{7-9}{2}\right)+\left(\frac{-2-3}{6}\right)x+\left(\frac{-1-3}{5}\right)x^2-\frac{7x^3}{4}$$
$$=-1-\frac{5x}{6}-\frac{4x^2}{5}-\frac{7x^3}{4} \quad \text{(Combining like terms)}$$

(iv) The difference is given by:

$$\left(\frac{1}{3}-\frac{5}{3}y^2\right)-\left(\frac{y^3}{3}+\frac{7y^2}{3}+\frac{y}{2}+\frac{1}{2}\right)$$
$$=\frac{1}{3}-\frac{5}{3}y^2-\frac{y^3}{3}-\frac{7y^2}{3}-\frac{y}{2}-\frac{1}{2}$$
$$=\frac{1}{3}-\frac{1}{2}-\frac{y}{2}-\frac{5}{3}y^2-\frac{7y^2}{3}-\frac{y^3}{3} \quad \text{(Collecting like terms)}$$
$$=\left(\frac{2-3}{6}\right)-\frac{y}{2}+\left(\frac{-5-7}{3}\right)y^2-\frac{y^3}{3}$$
$$=-\frac{1}{6}-\frac{y}{2}-4y^2-\frac{y^3}{3} \quad \text{(Combining like terms.)}$$

(v) The difference is given by:

$$\left(\frac{3}{2}ab-\frac{7}{4}ac-\frac{5}{6}bc\right)-\left(\frac{2}{3}ac-\frac{5}{7}ab+\frac{2}{3}bc\right)$$
$$=\frac{3}{2}ab-\frac{7}{4}ac-\frac{5}{6}bc-\frac{2}{3}ac+\frac{5}{7}ab-\frac{2}{3}bc$$

$$=\frac{3}{2}ab+\frac{5}{7}ab-\frac{7}{4}ac-\frac{2}{3}ac-\frac{5}{6}bc-\frac{2}{3}bc \quad \text{(Collecting like terms)}$$
$$=\left(\frac{21+10}{14}\right)ab+\left(\frac{-21-8}{12}\right)ac+\left(\frac{-5-4}{6}\right)bc$$
$$=\frac{31}{14}ab-\frac{29}{12}ac-\frac{3}{2}bc \quad \text{(Combining like terms)}$$

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