



Algebraic Expressions and Identities Ex 6.2 Q2

**Answer :**

$$\begin{aligned} \text{(i)} \quad & 12xy - (-5xy) \\ &= 12xy + 5xy \\ &= 17xy \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & -7a^2 - (2a^2) \\ &= -7a^2 - 2a^2 \\ &= -9a^2 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & (3a - 5b) - (2a - b) \\ &= (3a - 5b) - 2a + b \\ &= 3a - 5b - 2a + b \\ &= 3a - 2a - 5b + b \\ &= a - 4b \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & (4x^3 + x^2 + x + 6) - (2x^3 - 4x^2 + 3x + 5) \\ &= 4x^3 + x^2 + x + 6 - 2x^3 + 4x^2 - 3x - 5 \\ &= 4x^3 - 2x^3 + x^2 + 4x^2 + x - 3x + 6 - 5 \quad \text{(Collecting like terms)} \\ &= 2x^3 + 5x^2 - 2x + 1 \quad \text{(Combining like terms)} \end{aligned}$$

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

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

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

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

Algebraic Expressions and Identities Ex 6.2 Q3

**Answer :**

(i) The difference is given by:

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

(ii) The difference is given by:

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

(iii) The difference is given by:

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

(iv) The difference is given by:

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

(v) The difference is given by:

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

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