



Division of Algebraic Expressions Ex 8.5 Q2

Answer :

$$\begin{aligned} & \left(\text{i} \right) \frac{2x^2+5x+4}{x+1} \\ &= \frac{2x(x+1)+3(x+1)+1}{x+1} \\ &= \frac{(x+1)(2x+3)+1}{(x+1)} \\ &= \left(2x+3 \right) + \frac{1}{x+1} \end{aligned}$$

\therefore Remainder = 1

Therefore, $(x+1)$ is not a factor of $2x^2+5x+4$

$$\begin{aligned} & \left(\text{ii} \right) \frac{3y^3+5y^2+5y+2}{y-2} \\ &= \frac{3y^2(y-2)+11y(y-2)+27(y-2)+56}{y-2} \\ &= \frac{(y-2)(3y^2+11y+27)+56}{y-2} \\ &= (3y^2+11y+27) + \frac{56}{y-2} \end{aligned}$$

\therefore Remainder = 56

$\therefore (y-2)$ is not a factor of $3y^3+5y^2+5y+2$.

$$\begin{aligned}
 & \text{(iii)} \quad \frac{4x^4 + 2 + 15}{4x^2 - 5} \\
 &= \frac{x^2(4x^2 - 5) + 3(4x^2 - 5) + 30}{4x^2 - 5} \\
 &= \frac{(4x^2 - 5)(x^2 + 3) + 30}{4x^2 - 5} \\
 &= (x^2 + 3) + \frac{30}{4x^2 - 5}
 \end{aligned}$$

\therefore Remainder = 30

Therefore, $(4x^2 - 5)$ is not a factor of $4x^4 + 7x^2 + 15$

$$\begin{aligned}
 & \text{(iv)} \quad \frac{3z^2 - 13z + 4}{4 - z} \\
 &= \frac{3z^2 - 12z - z + 4}{4 - z} \\
 &= \frac{3z(z - 4) - 1(z - 4)}{4 - z} \\
 &= \frac{(z - 4)(3z - 1)}{4 - z} \\
 &= \frac{(4 - z)(1 - 3z)}{4 - z} \\
 &= 1 - 3z
 \end{aligned}$$

\therefore Remainder = 0

$\therefore (4 - z)$ is a factor of $3z^2 - 13z + 4$.

$$\begin{aligned}
 & \text{(V)} \quad \frac{10a^2 - 9a - 5}{2a - 3} \\
 &= \frac{5a(2a - 3) + 3(2a - 3) + 4}{2a - 3} \\
 &= \frac{(2a - 3)(5a + 3) + 4}{2a - 3} \\
 &= (5a + 3) + \frac{4}{2a - 3}
 \end{aligned}$$

\therefore Remainder = 4

$\therefore (2a - 3)$ is not a factor of $10a^2 - 9a - 5$.

$$\begin{aligned}
 & \text{(vi)} \quad \frac{8y^2 - 2y + 1}{4y + 1} \\
 &= \frac{2y(4y + 1) - 1(4y + 1) + 2}{4y + 1} \\
 &= \frac{(4y + 1)(2y - 1) + 2}{4y + 1} \\
 &= (2y - 1) + \frac{2}{4y + 1}
 \end{aligned}$$

\therefore Remainder = 2

$\therefore (4y + 1)$ is not a factor of $8y^2 - 2y + 1$.

***** END *****

