RD SHARMA

Solutions

Class 8 Maths

Chapter 8

Ex 8.5

Question 1: Divide the first polynomial by the second polynomial in each of the following. Also, write the quotient and remainder :

(i) $\frac{3x^2+4x+5}{x-2}$

Soln:

$\frac{3x^2+4x+5}{x-2}$

$= \frac{3x(x-2)+10(x-2)+25}{x-2}$

$= \frac{3x(x-2)+10(x-2)+25}{x-2}$

$= (3x + 10) + \frac{25}{x-2}$

Therefore,

Quotient = 3x+10 and remainder = 25

(ii) $\frac{10x^2-7x+8}{5x-3}$

Soln:

$\frac{2x(5x-3)-\frac{1}{5}(5x-3)+\frac{47}{5}}{5x-3}$

$= \frac{(5x-3)(2x-\frac{1}{5})(5x-3)+\frac{47}{5}}{5x-3}$

$= (2x - \frac{1}{5}) + \frac{\frac{47}{5}}{5x-3}$

Therefore , quotient= $(2x - \frac{1}{5})$ and remainder = $\frac{47}{5}$

(iii) $\frac{5y^3-6y^2+6y-1}{5y-1}$

Soln:

$\frac{5y^3-6y^2+6y-1}{5y-1}$

$= \frac{y^2(5y-1)-y(5y-1)+1(5y-1)}{5y-1}$

$= \frac{(5y-1)(y^2-y+1)}{5y-1}$

$= y^2-y+1+5$

Therefore quotient = y^2-y+1

And remainder = 0

(iv) $\frac{x^4-x^3+5x}{x-1}$

Soln:

$\frac{x^3(x-1)+5(x-1)+5}{x-1}$

$= \frac{(x^3+5)(x-1)+5}{x-1}$

$= (x^3+5) + \frac{5}{x-1}$

Therefore, quotient = x^3+5 and remainder= 5

(v) $\frac{(y^4+y^2)}{y^2-2}$

Soln:

$\frac{(y^4+y^2)}{y^2-2}$

$= \frac{y^2(y^2-2)+3(y^2-2)+6}{y^2-2}$

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

$(y^2+3) + \frac{6}{y^2-2}$

Therefore, quotient = y^3+3 and remainder = 6

Question 2: Find whether, or not the first polynomial is a factor of the second:

(i) $\frac{2x^2+5x+4}{x+1}$

Soln:

$= \frac{2x(x+1)+3(x+1)+1)}{x+1}$

$= \frac{(x+1)(2x+3)+1)}{x+1}$

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

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

Soln:

$\frac{3y^3+5y^2+5y+2}{y-2}$

$= \frac{3y^2(y-2)+11y(y-2)+27(y-2)+56}{y-2}$

$= \frac{(y-2)(3y^2+11y+27)+56}{y-2}$

$= (3y^2+11y+27) + \frac{56}{y-2}$

Therefore, (y-2) is not a factor of $3y^3+5y^2+5y+2$

(iii) $\frac{4x^4+12x^2+15}{4x^2-5}$

Soln:

$\frac{4x^4+12x^2+15}{4x^2-5}$

$= \frac{x^2(4x^2-5)+3(4x^2-5)+30}{4x^2-5}$

$= (x^2+3) + \frac{30}{4x^2-5}$

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

(iv) $\frac{3z^2-13z+4}{4-z}$

Soln:

$\frac{3z^2-13z+4}{4-z}$

$= \frac{3z(z-4)-1(z-4)}{4-z}$

$= \frac{(z-4)(3z-1)}{4-z}$

$= \frac{(4-z)(1-3z)}{4-z}$

$= 1-3z$

Therefore, remainder =0

(4-z) is a factor of the factor of $3z^2-13z+4$

(v) $\frac{10a^2-9a-5}{2a-3}$

Soln:

$\frac{10a^2-9a-5}{2a-3}$

$= \frac{5a(2a-3)+3(2a-3)}{2a-3}$

$= \frac{(2a-3)(5a+3)+4}{2a-3}$

$= (5a+3) + \frac{4}{2a-3}$

Therefore, remainder =4

(2a-3) is not a factor of the equation $10a^2-9a-5$

(vi) $\frac{8y^2-2y+1}{4y+1}$

Soln:

$= \frac{2y(4y+1)-1(4y+1)+2}{4y+1}$

$= \frac{(4y+1)(2y-1)+2}{4y+1}$

$= 2y-1 + \frac{2}{4y+1}$

Therefore, remainder =2

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