

# Mathematics

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(Chapter – 2) (Polynomials)(Exemplar Problems)

(Class – IX)

## Exercise 2.3

### Question 21:

Find the value of  $m$  so that  $2x - 1$  be a factor of  $8x^4 + 4x^3 - 16x^2 + 10x + m$ .

### Answer 21:

We have  $p(x) = 8x^4 + 4x^3 - 16x^2 + 10x + m$ ,  $g(x) = 2x - 1$

Put  $g(x) = 0$

$$\Rightarrow 2x - 1 = 0$$

$$\Rightarrow 2x = 1$$

$$\Rightarrow x = \frac{1}{2}$$

According to factor theorem if  $g(x)$  is a factor of  $p(x)$ , the remainder  $p\left(\frac{1}{2}\right)$  should be zero.

$$\text{Remainder} = p\left(\frac{1}{2}\right) = 0$$

$$\Rightarrow 8\left(\frac{1}{2}\right)^4 + 4\left(\frac{1}{2}\right)^3 - 16\left(\frac{1}{2}\right)^2 + 10\left(\frac{1}{2}\right) + m = 0$$

$$\Rightarrow 8 \times \frac{1}{16} + 4 \times \frac{1}{8} - 16 \times \frac{1}{4} + 10 \times \frac{1}{2} + m = 0$$

$$\Rightarrow \frac{1}{2} + \frac{1}{2} - 4 + 5 + m = 0$$

$$\Rightarrow 2 + m = 0$$

$$\Rightarrow m = -2$$

