

So the remainder by actual division is -7

Answer :

Let us denote the given polynomials as

$$f(x) = 2x^4 - 6x^3 + 2x^2 - x + 2,$$

$$g(x) = x + 2$$

$$\Rightarrow g(x) = x - (-2)$$

We have to find the remainder when $f(x)$ is divided by $g(x)$.By the remainder theorem, when $f(x)$ is divided by $g(x)$ the remainder is

$$\begin{aligned} f(-2) &= 2(-2)^4 - 6(-2)^3 + 2(-2)^2 - (-2) + 2 \\ &= 32 + 48 + 8 + 2 + 2 \\ &= \boxed{92} \end{aligned}$$

Now we will calculate the remainder by actual division

$$\begin{array}{r} 2x^3 - 10x^2 + 22x - 45 \\ x+2 \overline{) 2x^4 - 6x^3 + 2x^2 - x + 2} \\ \underline{2x^4 + 4x^3} \\ -10^3 + 2x^2 - x + 2 \\ \underline{-10x^3 - 20x^2} \\ + + \\ 22x^2 - x + 2 \\ \underline{22x^2 + 44x} \\ -45x + 2 \\ \underline{-45x - 90} \\ + + \\ 92 \end{array}$$

So the remainder by actual division is 92

***** END *****