Rješenja zadataka 3.1

Zadatak 1. Pokaži da zadana funkcija zadovoljava napisanu jednakost:

1) $f(x) = x^3 - 5x^2 + 8x - 4, \quad f(2) = f(1);$

2) $g(t) = t^3 - 3t^2 + 4t - 1, \quad g(2) = g(1);$

3) $h(u) = 4u^3 - 3u^2 - 5u - 6,$
$h(3) + 6h(1) = 0;$

4) $\varphi(x) = x^3 - 6x^2 + 11x - 10,$
$\varphi(1) = \varphi(2) = \varphi(3).$

Rješenje. **1)** $f(x) = x^3 - 5x^2 + 8x - 4,$

$$\left.\begin{aligned} f(1) &= 1 - 5 + 8 - 4 = 0, \\ f(2) &= 8 - 20 + 16 - 4 = 0 \end{aligned}\right\} \Longrightarrow f(2) = f(1);$$

2) $g(t) = t^3 - 3t^2 + 4t - 1,\ g(2) \neq g(1),$

$$\left.\begin{aligned} g(1) &= 1 - 3 + 4 - 1 = 1, \\ g(2) &= 8 - 12 + 8 - 1 = 3 \end{aligned}\right\} \Longrightarrow g(2) \neq g(1);$$

3) $h(u) = 4u^3 - 3u^2 - 5u - 6,\ h(3) + 6h(1) = 0,$

$$\left.\begin{aligned} h(3) &= 108 - 27 - 15 - 6 = 60 \\ h(1) &= 4 - 3 - 5 - 6 = -10 \end{aligned}\right\} \Longrightarrow h(3) + 6h(1) = 60 + 6 \cdot (-10) = 0;$$

4) $\varphi(x) = x^3 - 6x^2 + 11x - 10,$

$$\left.\begin{aligned} \varphi(1) &= 1 - 6 + 11 - 10 = -4 \\ \varphi(2) &= 8 - 24 + 22 - 10 = -4 \\ \varphi(3) &= 27 - 54 + 33 - 10 = -4 \end{aligned}\right\} \Longrightarrow \varphi(1) = \varphi(2) = \varphi(3).$$