Resoluciones seleccionadas, semana 02

2.3.b Para:

$$f(x) = 2x + 1, \qquad\qquad g(x) = x^3 - x^2 - 4$$

Calculamos $f \circ g$, $g \circ f$, $g + f$.
Solución:

$$
\begin{aligned}
(f \circ g)(x) &= f(g(x)) \\
&= 2g(x) + 1 \\
&= 2(x^3 - x^2 - 4) + 1 \\
&= 2x^3 - 2x^2 - 7
\end{aligned}
$$

$$
\begin{aligned}
(g \circ f)(x) &= g(f(x)) \\
&= f(x)^3 - f(x)^2 - 4 \\
&= (2x + 1)^3 - (2x + 1)^2 - 4 \\
&= 8x^3 + 12x^2 + 6x + 1 - (4x^2 + 4x + 1) - 4 \\
&= 8x^3 + 8x^2 + 2x - 4
\end{aligned}
$$

$$
\begin{aligned}
(f + g)(x) &= f(x) + g(x) \\
&= (2x + 1) + (x^3 - x^2 - 4) \\
&= x^3 - x^2 + 2x - 3
\end{aligned}
$$