

$$\begin{aligned}
 f) \quad g(x) &= x \cdot (3x^2 - 5)^4 \\
 g'(x) &= 1 \cdot (3x^2 - 5)^4 + x \cdot 4 \cdot (3x^2 - 5)^3 \cdot 6x \\
 &= (3x^2 - 5)^3 \cdot [(3x^2 - 5) + 24x^2] \\
 &= (3x^2 - 5)^3 \cdot (27x^2 - 5)
 \end{aligned}$$

$$\begin{aligned}
 g) \quad y(x) &= (4 - x^2)^3 \cdot (x^3 + 1)^4 \\
 y'(x) &= 3(4 - x^2)^2 \cdot (-2x) \cdot (x^3 + 1)^4 + (4 - x^2)^3 \cdot 4 \cdot (x^3 + 1)^3 \cdot 3x^2 \\
 &= -6x(4 - x^2)^2(x^3 + 1)^3 \cdot [(x^3 + 1) - (4 - x^2) \cdot 2x] \\
 &= -6x(4 - x^2)^2(x^3 + 1)^3 \cdot (x^3 + 1 - 8x + 2x^3) \\
 &= -6x(x^2 - 4)^2(x^3 + 1)^3 \cdot (3x^3 - 8x + 1)
 \end{aligned}$$

$$\begin{aligned}
 h) \quad f(x) &= 3 - x \cdot (x + 4)^3 \\
 f'(x) &= 0 - [1 \cdot (x + 4)^3 + x \cdot 3(x + 4)^2] \\
 &= -(x + 4)^2 \cdot [(x + 4) + 3x] \\
 &= -(x + 4)^2 \cdot (4x + 4) \\
 &= -4 \cdot (x + 4)^2 \cdot (x + 1)
 \end{aligned}$$