

1. If $g(x) = \frac{x^3 + x}{1 - x - x^2}$, find $\frac{dg}{dx}$.

2. If $f(x) = x^2 \sin(x)$, find $\frac{df}{dx}$.

3. Find the slope of the tangent line to the curve $y = (x^2 + x + 1)(x^3 - x - 1)$ at $x = 1$.