

Functions Homework #3

1. If $g(x) = 1 - x^2$ and $f(g(x)) = \frac{1 - x^2}{x^2}$ when $x \neq 0$ find $f\left(\frac{1}{2}\right)$
2. Find all solutions for $f(x)$ if $21f(x) + 7f\left(\frac{1}{x}\right) = 12x$ [Redo because of typo]
3. If $f(x) = x^2 + x - 1$ for $x \geq -2$ and $g(x) = x^2 - 1$ for $x < 5$ then what is the domain and range of $f \circ g$? What is the domain and range of $g \circ f$?
4. Find a function which satisfies $f(x + t) - f(x - t) = 4xt$
5. If $f(1 - x) + (1 - x)f(x) = 5$, then find $f(5)$.
6. Given that $f(ax) = af(x)$ for all real numbers a and $f(4) = 7$ find $f(\pi)$
7. If $f(x^2 + 3x + 1) = 5x^4 + 30x^3 + 53x^2 + 24x + 9$ then $f(x) =$