EMT111 Practice Problems IV

Functions and Partial Fractions

October 1, 2010

1. Find the inverse function of f.

    (a) (i) $f(x) = 2x + 1$ (ii) $f(x) = 6 - x$

    (b) $f(x) = \frac{x-2}{x+2}$

    (c) $f(x) = \sqrt{2 + 5x}$

2. Find the domain of each function given in question 1.

3. If $f(x) = 1 + x^2$ and $g(x) = \sqrt{x-1}$, find each of the following functions.

    (a) $f \circ g$ (b) $g \circ f$ (c) $(f \circ g)(2)$ (d) $f \circ g \circ f$

4. If $f(x) = 5 - 2x$, find (a) $f(3)$ (b) $f^{-1}(3)$.

5. Find the partial fraction decomposition of the rational function.

    (a) $\frac{5}{(x-1)(x+4)}$

    (b) $\frac{12}{x^2-9}$

    (c) $\frac{x^2-3x+5}{(x-2)^2(x+4)}$

    (d) $\frac{x^2}{(x-3)(x^2+4)}$

    (e) $\frac{2x^4+4x^3-2x^2+x+7}{x^3+2x^2-x-2}$