Midterm 1 - Mini Review Session - Problems

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Problem 1

Simplify $\sin\left(\tan^{-1}(x)\right)$

Problem 2

Show, using the definition of a limit, that $\lim_{x\to 4} 7-3x=-5$

Problem 3

Define: $\lim_{x\to\infty} f(x)=L$

Problem 4

Calculate $\lim_{x\to 2} \frac{x^2-x-6}{x-2}$

Problem 5

Calculate $\lim_{x\to 2} \frac{x^3-8}{x^2-3x+2}$

Problem 6

Show, using the definition of the derivative, that if $f(x)=x^2+2x-1$, then $f'(x)=2x+2$

Problem 7

Find an equation of the tangent line to the graph of $f(x)=\frac{\sin(x)}{x^2}$ at $x=\pi$.