Math 32 Worksheet
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Find two or three people to work with at the boards, and work through the following problems. Take turns writing; everyone should get a chance to write for some of the problems. Also, make sure everyone in your group understands the solution. Simply getting the answer is not the point of these worksheets, rather discuss the solution to make sure you and your other group members understand it.

Quadratic Functions and Optimization

1. Without sketching a graph of the function, determine the coordinates of the minimum or maximum of each. State whether it is a minimum or maximum.
(a) $f(x) = 3x^2 + 6x - 10$
(b) $g(t) = -7t^2 + 21t$
(c) $y = x^2 - 5$

2. Determine the inputs that yield the minimum values for each function. Compute the minimum value in each case.
(a) $f(x) = \sqrt{x^2 - 10x + 36}$
(b) $g(x) = \sqrt[3]{x^2 - 10x + 36}$
(c) $h(x) = x^4 - 10x^2 + 36$

3. Find a quadratic function that has axis of symmetry $x = 1$, a y-intercept of -2, and only one x-intercept.

4. Find the dimensions of a rectangle with perimiter P whose area is a maximum. Your answer will be in terms of P. What is the significance of your answer?