

NOTE: These problems are to be done on Engineering paper, using the standard homework format. You may consult with other students, tutors, or me on this assignment. Questions about these problems will not be answered during class.

1. Solve the following inequality graphically: $\frac{x^2 - 3x - 14}{x - 2} \geq 1$. Write the solution in interval notation. Include a sketch of the graph that you use.
2. Find the domain of the function $g(x) = \frac{10}{x^2 - 3x}$.
3. For the function $f(x) = 4x - x^2$ evaluate the expression $\frac{f(x+h) - f(x)}{h}$. Simplify completely.
4.
 - a) Use a graphing calculator to graph the function $h(x) = x^4 - 9x^2 + 4x + 12$ in the window $[-6, 6] \times [-40, 100]$. Sketch the resulting graph on your paper.
 - b) Determine the open intervals (to 3 decimal places) on which the function is increasing or decreasing.
5. A point $P(x, y)$ lies in the first quadrant on the parabola $y = 16 - x^2$, as indicated in the figure. Recall that the area of a triangle is given by the formula $A = \frac{1}{2}bh$ (where b is the base and h the height).
 - a) Write a function $A(x)$ for the area of the triangular region shaded in the figure.
 - b) Graph the function $A(x)$ using your graphing calculator. Use the calculator to determine the maximum possible area (to 3 decimal places) of such a triangle. Include a sketch of the graph that you use.

