For more information and practice, see the class homework blog on OpenLab

Instructions: These problems are for you to use to test yourself, **after** you have practiced with the routine homework assignments, to see how ready you are for Test 1. They are not meant as a substitute for regular and diligent practice!

Do the following problems as if you were taking a test: without notes or textbook, and give yourself a time limit as stated at the start of each self-test. At the end of that time, check your answers against the answers which will be posted to the blog:then review as needed before you repeat the self-test.

Self-Test : allow 50 minutes for parts A-C

Part A: Solve the equation. Leave your answers in the form of rational numbers in lowest terms (that is, not decimals!).

1) $|x - 5| = 3$

2) $|4x - 5| = 12$

Part B: Solve the inequality. Give your answers in three forms: as inequalities, in interval form, and draw the graph.

3) $|x - 5| \leq 2$

4) $|x + 2| > 2$

Part C: Using your graphing calculator, find the solution(s) of the given equation which lie in the given interval. Round your answers to three decimal places. You must state which functions on the graphing calculator you used in order to solve the equation and show any work you did by hand here.

5) $x^3 + 2x^2 = 11x + 6$; $[0, \infty)$

6) $x^3 + 2x^2 = 11x + 6$; $(-\infty, 0)$

7) $x^4 + x^3 - 10x^2 = 8x + 16$; $[0, \infty)$

8) $2x^4 + x^3 - 2x^2 + 6x + 2 = 0$; $(-\infty, -1)$

Part D: allow 30 minutes

1) Find the domain of each of the following functions

    a) $f(x) = x^2 - 3x$

    b) $f(x) = \sqrt{x - 3}$

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

2) A function $A(x)$ is defined as follows:

$$A(x) = \begin{cases} x - 3 & \text{if } x \le 5 \\ 2x + 1 & \text{if } x > 5 \end{cases}$$
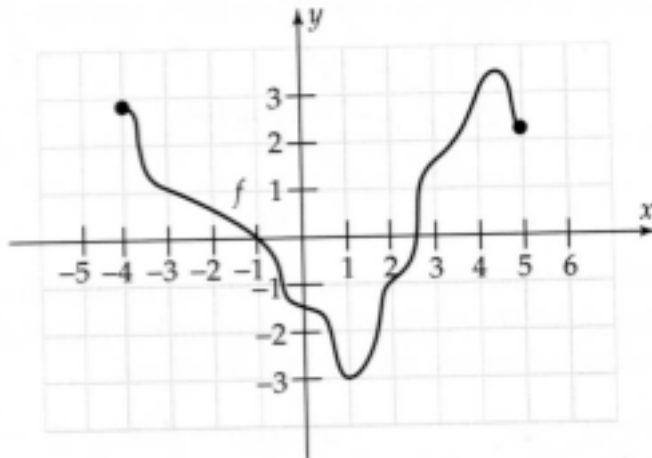
Find each of the following values:

$A(0) =$

$A(5) =$

$A(10) =$

What is the domain of A(x)?

3) Find the domain and range of the function whose graph is given below: approximate if necessary.

4) Find the equation of the line which passes through the points $(-1, 4)$ and $(2, -2)$ in slope-intercept form: reduce fractions to lowest terms (do not use decimals).

5) Compute and simplify the difference quotient $\frac{f(x+h)-f(x)}{h}$ for the function $f(x) = 3x - 2x^2$

6) Give the formula for the function g(x) whose graph is the same as the graph of $f(x) = \sqrt{x}$ but shifted to the left by 3 units and down by 2 units.