NAME: _____

Instructions: The exam questions are closely related to the homework and to the examples shown in class. Make sure you review your WeBWorK assignments.
For more practice you are strongly encouraged to do the suggested homework from the textbook.

OpenLab: Please register for the OpenLab if you don't have an OpenLab account yet:
https://openlab.citytech.cuny.edu/
This is a very quick process once you know how to access your City Tech email.
Once you are registered please visit our class site and click "join" (below the picture):
https://openlab.citytech.cuny.edu/groups/mat-1375-precalculus-ghezzi-spring-2019/
(you need to login to OpenLab to be able to join).
Solutions to this review sheet and other important documents will be posted on this site.

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1. Find a polynomial of degree 4 with real coefficients, whose roots include -2, 5, and $3-2i$. (Note: You can leave the polynomial in factored form, but your answer should not have i.)

2. Find a polynomial of degree 3 whose roots are $0, 1, 3$, and so that $f(2) = 10$. (Note: You can leave the polynomial in factored form.)

3. Given $f(x) = \dfrac{x-2}{x^2+x+1}$, find the domain, the x- and y-intercepts, the horizontal and vertical asymptotes algebraically. Then use the graph of $f(x)$ to check your answer.

4. a) Given $f(x) = \dfrac{3x-9}{2-x}$, find the domain, the x- and y-intercepts, the horizontal and vertical asymptotes algebraically.

   b) Sketch a complete graph of the function (label the x- and y-intercepts, the horizontal and vertical asymptotes).

   c) Solve the inequality $\dfrac{3x-9}{2-x} \geq 0$ algebraically. Then check your answer graphically.

5. Solve the inequality $25 - 9x^2 < 0$ algebraically. Then check your answer graphically.

6. Divide by long division $\dfrac{2x^3 + x^2 + 3x + 5}{x-1}$.

7. Find all roots of the polynomial $f(x) = x^3 + 7x^2 + 13x + 7$ algebraically in simplest radical form. Sketch a graph of the polynomial with all roots clearly marked.

8. Given $f(x) = \dfrac{x^2 - 36}{x-6}$, find the domain, the x- and y-intercepts, the horizontal and vertical asymptotes algebraically. Then use the graph of $f(x)$ to check your answer.

9. Solve the inequality $15x^2 + 22x - 5 \leq 0$ algebraically. Then check your answer graphically.