

Name: \_\_\_\_\_ Period: \_\_\_\_\_

**PC 2-Review** Show work on all problems

1) Consider the polynomial function  $f$  with a root of  $3i$ . Find and list all roots.

$$f(x) = x^4 + 4x^3 + 13x^2 + 36x + 36$$

2) Write the equation of the polynomial in **factored form** given the description:

a) Degree 7  
Zeros: 4 (multiplicity 2)  
2  
-6 (multiplicity 4)

b) Degree 4  
Zeros:  $7i$   
0  
-12

3) Given a polynomial with the roots shown below, write a possible polynomial in standard form.

$$x = \{3, 5 + 2i, 5 - 2i\}$$

4) Given  $g(x) = 3x^4 - 3x^3 + 2x^2 + x + 10$

a) Use Descartes Rule of Signs to determine the number of positive, negative, and imaginary roots.

b) Use the Rational Zeros Theorem to create a list of potential rational zeros.

5) Given  $h(x) = x^3 - x^2 - 10x - 8$ , determine if  $(x+4)$  is a factor of  $h(x)$ .

6) Given  $R(x) = \frac{x^2+5x-6}{x^2-x-20}$ , find the following. If none, write 'none'.

a) x-intercept(s)

b) y-intercept(s)

c) vertical asymptote(s)

d) Horizontal asymptote

e) Oblique Asymptote

f) POI with the graph and any horizontal/oblique asymptotes

g) Graph  $R(x)$  using your answers.

7) A function has a horizontal asymptote at 6. It also has vertical asymptotes at 4 and -7. It crosses the x-axis at -2. Write the equation that follows those constraints.

8) Given the graph, write a possible equation of rational function.

