

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.

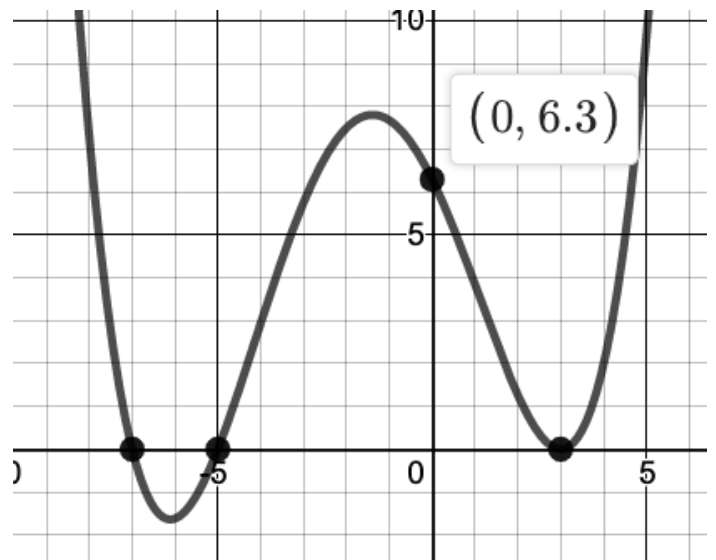
b) Use the Rational Zeros Theorem to create a list of potential rational zeros.

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

6) Write the equation of a polynomial (in factored form) with the following characteristics:

- 1) $f(-7) = 0$
- 2) $(x - 10)$ is a factor of the polynomial
- 3) $(x + 3)$ is a factor of the polynomial
- 4) $f(1) = 5$
- 5) The degree of the polynomial is 3.

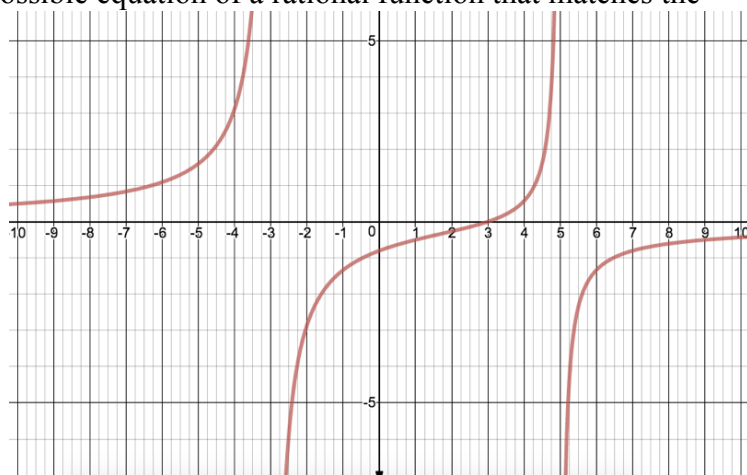
7) Write the equation of the graph shown.



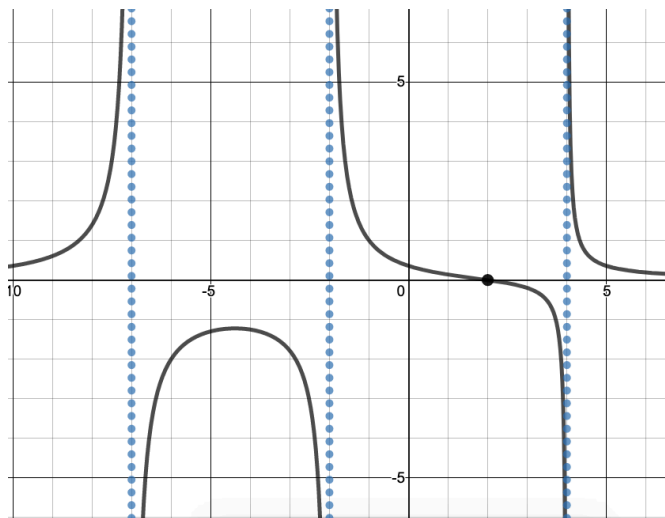
8) Given that $x=1$ is a root of $f(x) = x^3 + 2x^2 + 4x - 7$, find all of the roots.

9) 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.

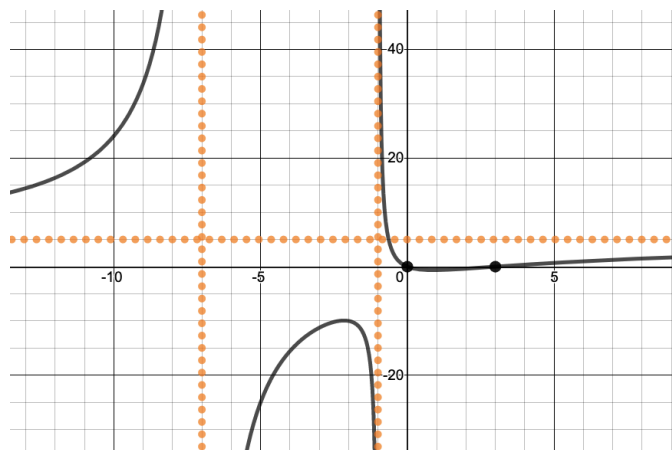
10) Write a possible equation of a rational function that matches the graph below.



11) Write a possible equation of a rational function that matches the graph below.



12) Write a possible equation of a rational function that matches the graph below.



13) 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.

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.