

Honors Pre-Calculus Chapter 2 Worksheet

1. Sketch the graph of the following quadratic functions.

a)  $f(x) = (x - 3)^2 - 1$

b)  $f(x) = -\frac{3}{2}(x + 1)^2 + 4$

c)  $f(x) = 2x^2 - 10x + 5$

2. Find the quadratic function with the given information: vertex at (4,1) contains the point (10,10)

3. Put the following into vertex form:  $f(x) = 4x^2 - 3x + 5$

4. Determine the left and right end behaviors of  $f(x) = \frac{27}{8}x^9 - 4x^6 + \frac{3}{2}x^5 - 9x^4 + 3x^2 - 146$

5. Divide the following by long division  $(5x^2 - 17x - 17) \div (x - 4)$ .

6. Divide by synthetic division.

a)  $(4x^3 - 5x^2 - 11x - 13) \div (x - 3)$

b)  $\frac{x^5 - 13x^4 - 120x + 180}{x + 3}$

7. Find a polynomial function that has the given zeros.

a)  $x = 2, -1, -1$

b)  $x = 5, 2i$

8. Find all zeros of the following:

a)  $f(x) = x^2 - 3x - 28$

b)  $f(x) = x^4 - x^3 - x + 1$

c)  $f(x) = x^4 - 2x^3 - 10x^2 + 8x + 24$  given  $x = 1 + \sqrt{7}$  is one zero

9. Perform the following. Put answers in standard form.

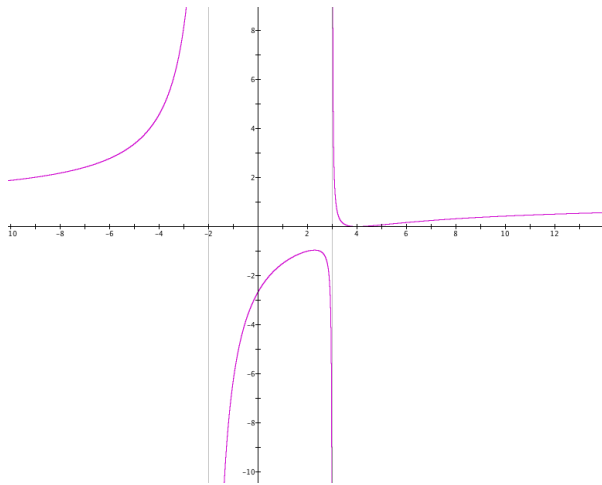
a)  $(4 - 7i) + (9 + 10i)$

b)  $(5 + i)(3 - 2i)$

c)  $\frac{(3 - 5i)}{(2 + i)}$

10. List the possible rational zeros of  $7x^5 - 4x^4 + 8x^3 - x^2 - 24$

11. Show the behavior using  $As x \rightarrow$  notation. The graph has a horizontal asymptote at  $y=1$ .



12. Use Descartes' Rule of Signs to determine the possible number of positive, negative, and imaginary zeros of  $f(x) = -x^5 + 3x^4 + x^3 + 8x^2 + 1$

13. Find all of the following that exist: domain, zeros, y intercept, asymptotes, P.O.D.  $f(x) = \frac{x^4 - 5x^2 + 4}{x^2 + 4x + 3}$

14. Write the partial fraction decomposition for the rational expression.  $\frac{5x^3 - 3x^2 + 2x + 1}{x^4 + x^2}$