Honors Pre-Calculus Chapter 2.4-2.7 Worksheet

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

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

b) $x = 5,2i$

2. 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

3. Perform the following. Put answers is standard form.

a) $\sqrt{-12} \cdot \sqrt{-3}$

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

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

d) $\dfrac{(3 - 5i)}{(2 + i)}$

e) $\dfrac{2i}{2 + i} + \dfrac{5}{2 - i}$

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

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

6. Find all zeros of the following and write it as a product of linear factors..

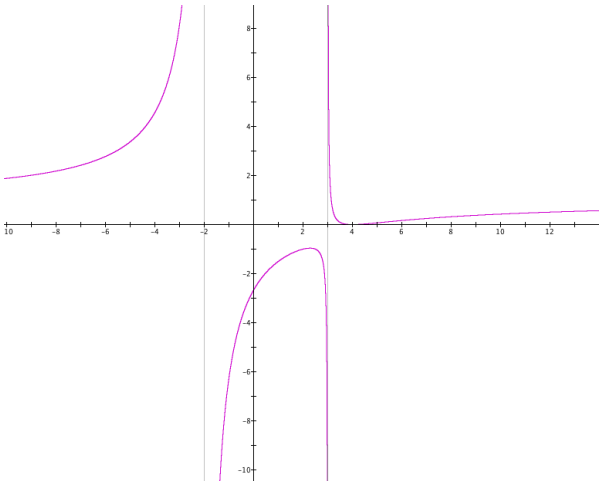
a) $f(x) = x^4 + 6x^3 + 10x^2 + 6x + 9$

b) $f(x) = x^4 - x^3 - 8x^2 - 12x - 240$

7. Use the information in the tabel to find the zero(s) of the function, the least possible degree and write a product of linear factors.

| Interval | Value of f(x) |
|---|---|
| $(-\infty,-1)$ | Negative |
| $(-1,-2)$ | Negative |
| $(2, \infty)$ | Positive |

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



9. Find a rational function that has a vertical asymptote at $x = -2$, a horizontal asymptote at $y = 2$ and a zero at $x = 5$.

10. Find all of the following that exist: domain, zeros, y intercept, asymptotes, P.O.D.

$$f(x) = \frac{x^4 - 5x^2 + 4}{x^2 + 4x + 3}$$

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