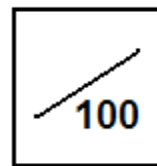


- ▶ This assignment is to be written up individually ( I should not see identical papers ).
- ▶ Work primarily by yourself. You may ask a question of Mr. Hamilton before or after school, but you should not “give away” how to do problems to your peers.
- ▶ Points will be earned for each of your solution process, explanation, and answer. *An answer alone will not be enough to earn a decent grade!*
- ▶ Please do all work on separate sheets of paper and attach this to the front. (Exceptions noted.)
- ▶ Please be organized and have all problems submitted sequentially!! (1, 2, 3, 4,...)
- ▶ This is due at the beginning of class Thursday. Assignments turned late are automatically deducted 50% of the possible points. Any assignment submitted after Tuesday, February 21, will be an automatic zero.



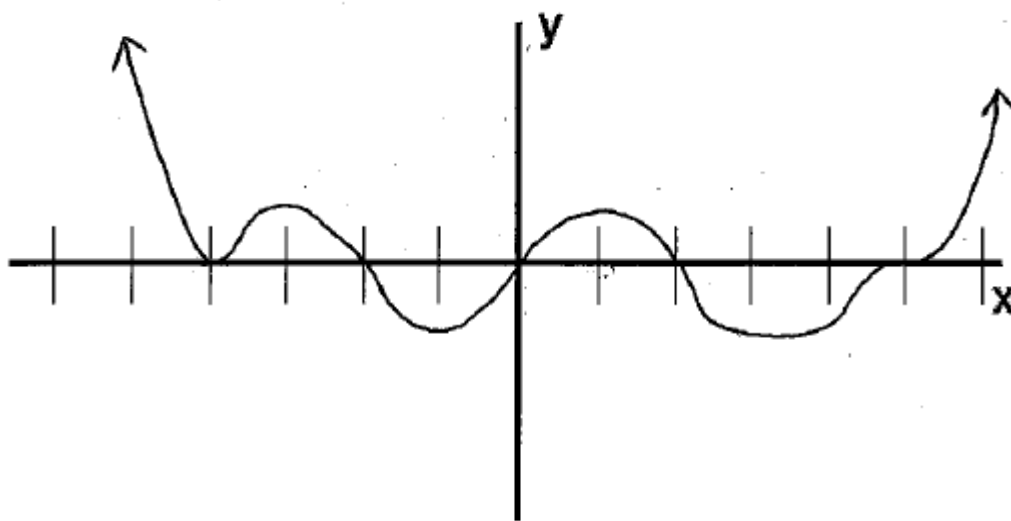
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- 1.) Find the quotient and remainder when  $(x^6 + 5x^5 - 7x^4 + 22x^2 - 5x - 7)$  is divided by  $(x^2 + 5x - 4)$ . Then, write the original expression in the divisor, quotient, and remainder form. [ 6 Points ]
  
  - 2.) What is the remainder when  $(99x^{57} - 5x^{28} + 3x^{21} - 4x^{12} + x - 121)$  is divided by  $(x + 1)$ ? [ 3 Points ]
  
  - 3.) Given the graphs in **Figures 1.1 – 1.4**, do the following (on those pages) [ 12 Points ]
    - A.) State all of the zeros of each polynomial function.
    - B.) Write a possible factored form of each polynomial function.
    - C.) Provide a brief explanation as to how you arrived at your answer.
  
  - 4.) Find the quotient and remainder when  $(x^{11} - 4x^9 + 7x^5 - 8x^4 + 11x^3 + 2x^2 - x + 10)$  is divided by  $(x - 2)$ . [ 5 Points ]
  
  - 5.) According to the Rational Zeros Theorem, what are all of the possible rational zeros for the function  $f(x) = 8x^{14} + 5x^9 - 5x^5 + 13x^3 + 2x + 15$ ? [ 5 Points ]
  
  - 6.) Find the value(s) of  $k$  so that  $(x + 1)$  is a factor of  $5x^3 + k^2x^2 + 2kx - 3$ . [ 5 Points ]

- 7.) Find values of  $a$  and  $b$  so that  $(x+1)$  and  $(x-3)$  are factors of the function  $P(x)=x^4-5x^2+ax+b$ . [ 5 Points ]
- 8.) If three of the zeros of  $f(x)=x^4+ax^2+bx+c$  are  $x=1, x=2$ , and  $x=3$ , what is the value of  $b+c$ ? [ 3 Points ]
- 9.) When a polynomial  $P(x)$  is divided by  $(x+14)$ , the quotient is  $(x^3-4x+5)$  and the remainder is  $-2$ . [ 6 Points ]  
 A.) Write an expression for  $P(x)$  using the divisor, quotient, and remainder form.  
 B.) Expand your answer in "A" to write the polynomial in standard form.
- 10.) Factor completely: [ 12 Points ]  
 $P(x)=15x^7-22x^6-70x^5+52x^4+123x^3+2x^2-44x-8$ .
- 11.) Given that  $(1-2i)$  is a zero of  $P(x)=x^7-11x^6+47x^5-105x^4+119x^3+11x^2-167x+105$ , find all other zeros of  $P(x)$  in exact form. [ 12 Points ]
- 12.) Solve the equation for all complex values of  $x$  (in exact form) given that  $x=-1+\sqrt{2}$  is a solution: [ 12 Points ]  
 $2x^8+x^7+105x^5+78x^4+202x^2+107x=14x^6+429x^3+52$
- 13.) Sketch a graph of  $f(x)=-2x^6+4x^5+16x^4-28x^3-22x^2+56x-24$  by hand. This includes justifying all work used to render your graph. [ 12 Points ]  
*You cannot simply view this on your graphing calculator for credit!!*
- 14.) Suppose  $P(x)$  is a polynomial constructed such that when it is divided by  $(x-20)$  the remainder is 12 and when it is divided by  $(x-12)$  the remainder is 20. Determine the remainder when  $P(x)$  is divided by  $(x-20)(x-12)$ . [ 2 Points ]

Written Assignment #2

Appendix: Figure 1 (Front and Back)

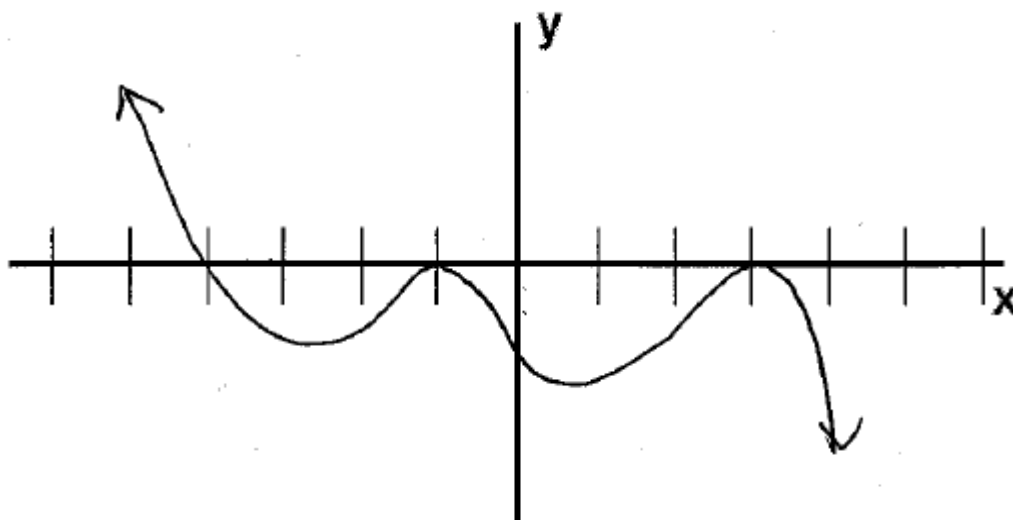
Figure 1.1 Degree 8



Zeros: \_\_\_\_\_

Factored: \_\_\_\_\_

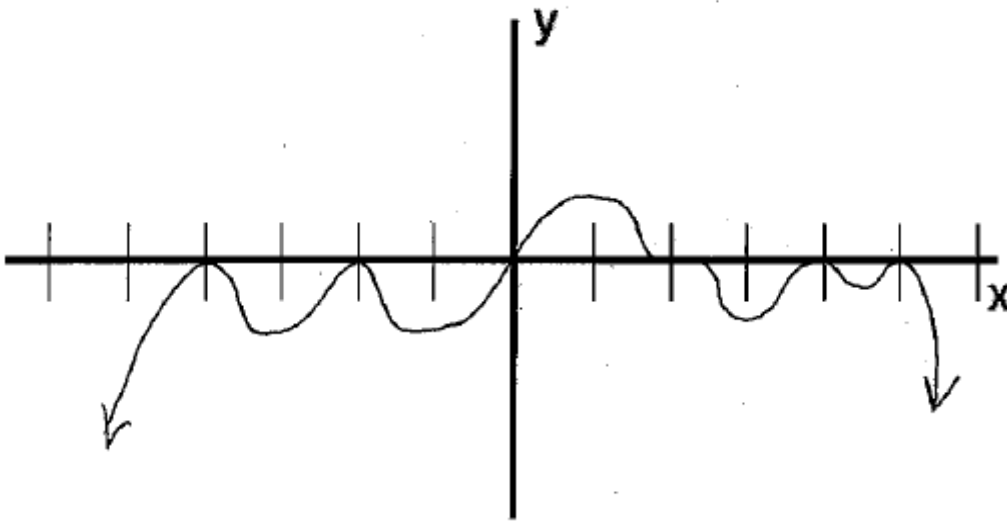
Figure 1.2 Degree 5



Zeros: \_\_\_\_\_

Factored: \_\_\_\_\_

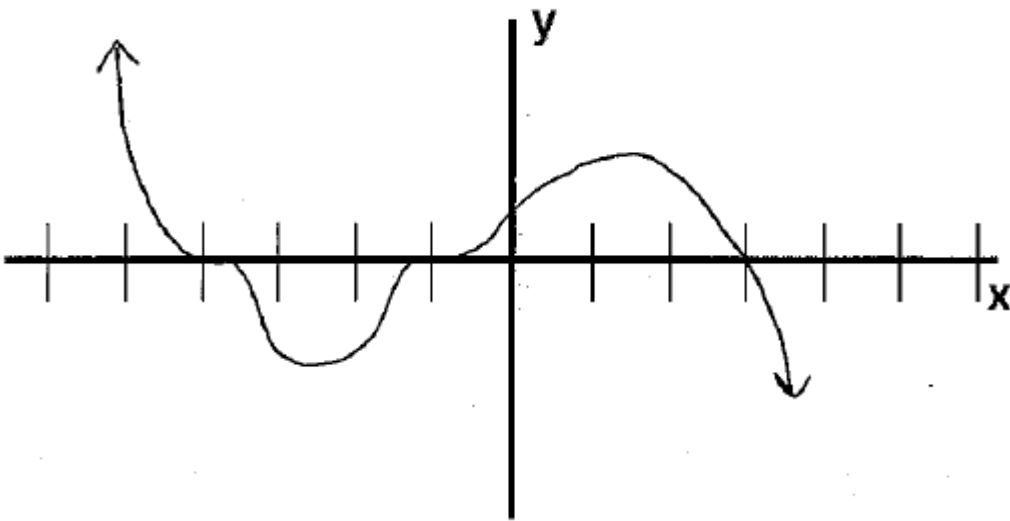
Figure 1.3 Degree 12



Zeros: \_\_\_\_\_

Factored: \_\_\_\_\_

Figure 1.4 Degree 7



Zeros: \_\_\_\_\_

Factored: \_\_\_\_\_