Answer Key

Math 1155
Fall 2004 Final Exam

Multiple Choice Problems
1. E  
2. B  
3. A  
4. C  
5. B  
6. C  
7. ----  
8. problems missing on copy  
9. ----  
10. D  
11. A  
12. E  
13. D  
14. B  
15. A  
16. C  
17. D

Written Answer Problems
18.  
   a) see solution set  
   b) i) odd degree   ii) at least degree 5   iii) \( f(x) = \frac{1}{9}x(x+2)^2(x-2)^2 \)

19.  
   a) solution interval: \((-1, \frac{1}{2})\)  
   b) solution interval: \((-\infty, -1)\)  
   c) solution intervals: \((\frac{\pi}{3}, \pi)\) and \((\pi, \frac{5\pi}{3})\)  
   d) see solution set

20.  
   a) \( y = 4 \cos\left(\frac{\pi}{3}x - \frac{\pi}{3}\right) + 2 \)  
   b) see graph below

21.  
   a) domain: \( x \neq -2, \ x \neq 2 \); x-intercepts: \( x = -1, \ x = 0 \)  
       \( f(x) > 0 \) on \((-1, 0)\) and \((2, \infty)\),  
       \( f(x) < 0 \) on \((-\infty, -2), (-2, -1)\), and \((0, 2)\)  
   b) vertical asymptotes at \( x = -2 \) and \( x = 2 \); oblique asymptote: \( y = x + 1 \)  
   c) see graph below
graph for Problem #20(b) –

graph for Problem #21(c) –

oblique asymptote: 
\[ y = x + 1 \]

close-up of region near the origin