Answer the questions and put a box around your final answer. You may us a graphing calculator to complete the test.

1. Factor and simplify:.
2. Find  if .
3. Given  and , find  and its domain.
4. Find the inverse of . Write the domain and range of the inverse function.
5. Use the Intermediate Value Theorem to show the there is a zero between 1 and 2 for the function . Explain yourself.
6. Given the function , find function f(-2) two ways.
7. List all possible rational roots for .
8. Find all actual roots for .
9. Find the intervals where the function  is positive and negative. Show all work. Graph it.
10. 
11. 
12. Find 
13. Find all asymptotes (horizontal, oblique, and vertical) and holes for 
14. Graph one period of .
15. Graph .
16. Graph one period of .
17. 
18. =
19. 
20. 
21. 
22. 
23. 
24. =

Solve the trigonometric equations on the interval [0,2π)

1. 
2. 

Verify one of the two trigonometric identities.

1. 
2. 
3. A flagpole is 30 feet tall and cast a shadow on the ground. How long is the shadow if the angle of depression from the tip of the pole to the tip of the shadow is 68°?
4. Lookout station B is located 5 mi due east of station A. The bearing of a fire from A is S 10°W and the bearing from B is S 40°W. Determine the distance from the fire to B (to the nearest tenth of a mile).

Is the following sequence arithmetic, geometric, or neither? If arithmetic or geometric, find **d** or **r** AND **an**.

1. 7, 3, -1, -5, -9, …
2. 2, 3, 5, 8, 19, 27, …
3. 8, -4, 2, -1, ½, …

Identify, discuss, and graph all important values, points, and asymptotes.

1. 