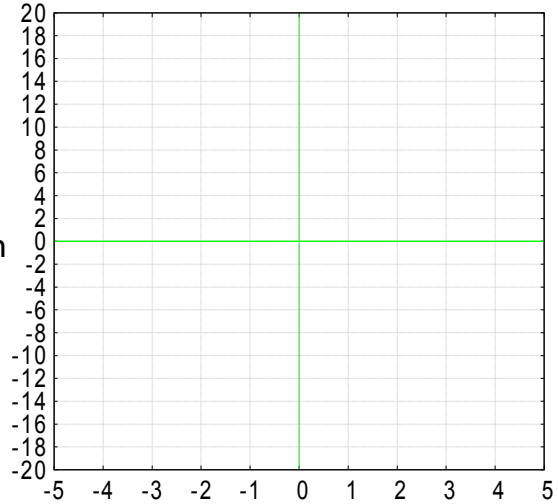MS 100 College Algebra midterm fall 2006 Name:

1. For the equation $y = -x^2 + 2x + 8$

   a. _____ Find the degree.

   b. _____ Is the lead coefficient positive or negative?

   c. _____ Will the graph open up ($\cup$) or open down ($\cap$)?

   d. _____ Find the y-intercept.

   e. _____ , _____ Find the x-intercepts.

   f. _____ Solve $2ax + b = 0$ for x to find the x-value for the vertex.

   g. Make a graph of the equation using the above information.

   h. _____ What is the name of the shape produced by this equation?

   i. Is the curvature of the graph positive or negative?

   j. Is there an inflection point in the function? If there is, mark it on the graph.

   k. Mark the areas where the function is increasing, decreasing, and/or constant on the graph.

   l. Mark any local maxima or local minima on the graph.

   m. _____
      Toughie: Use slope $m = 2ax + b$ to find the linear equation for the slope.

2. x = _____ Solve for x: $\dfrac{7x}{3} - 210 = x + 210$

3. Is $x(x + 30) + 221 = (x + 13)(x + 17)$ an identity or a conditional statement?

4. y = _____ Find the y-intercept for $y = x^2 - 2x - 323$

5. _____ , _____ Find the x-intercepts for $y = x^2 - 2x - 323$
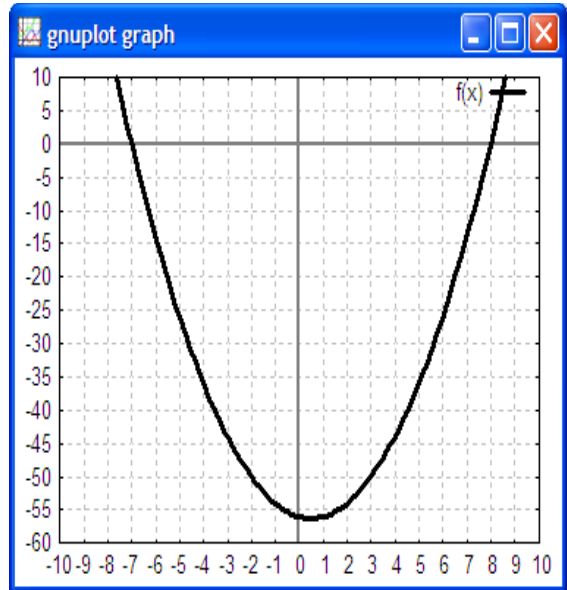
6. _____ Rice selling for $18.00 is marked down 15%. What is the sale price?

7.  Solve: $-x^2 - 32x - 252 = 0$

8.  Solve: $7x^2 + 28x - 28 = 1736$

9.  Solve: $x^2 + 32x + 260 = 0$

10. For the graph shown on the right, determine the equation.

y =



11. Subtract:  $(16 + 2i) - (16 - 2i)$

12. Multiply:  $(16 + 2i)(16 - 2i)$

13. Multiply:  $(x + 16 + 2i)(x + 16 - 2i)$

14. Solve for x:  $x - \sqrt{x+16} = 4$

15. Solve and sketch answer on a number line:
    $-14x + 16 \le 268$

16. Solve and sketch answer on a number line:    $-14x + 16 \ne 268$

17. Find the zero for the function $f(x) = 5x + 105$

18. Is $f(x) = -0.2x + 40$ parallel, perpendicular, or neither, to $f(x) = 5x + 105$?

19. Solve for x:  $\dfrac{1}{x^2} + \dfrac{1}{8} = \dfrac{33}{200}$

20.  a. Is the function f(x) depicted in the graph an even or odd function?

     b. How many zero's does the function have?



21.  For a quadratic of the form $f(x) = ax^2 + bx + c$ the slope m is equal to $2ax + b$.

     a. Given the above, is the function $f(x) = x^2 + 18x + 9$ parallel to $f(x) = x^2 + 18x + 19$?

     b. Why or why not?
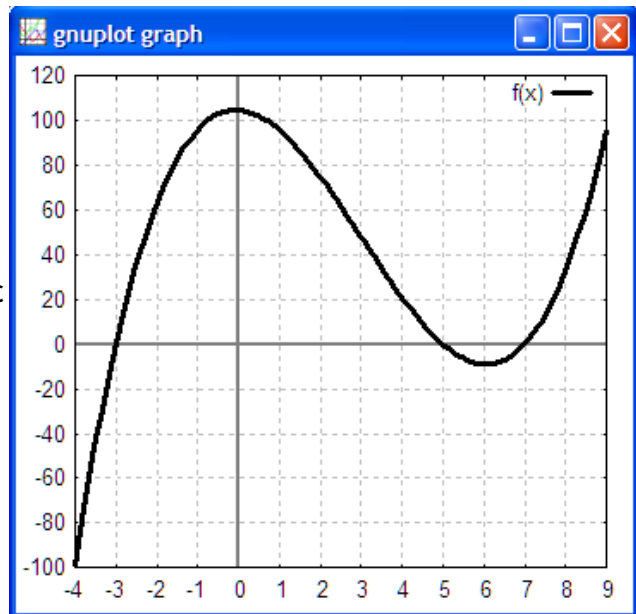
```
reset
set border
set xtics 1
set ytics 1
set grid
set xzeroaxis lt 9 lw 2
set yzeroaxis lt 9 lw 2
set style line 1 lt -1 lw 3
set style line 2 lt 5 lw 3
set style line 3 lt 12 lw 3
set xrange [-20:10]
set yrange [-20:10]
# set samples 1000
# set key off
f(x)=-x**2-32*x-252
g(x)=x**2+32*x+260
h(x)=-4+sqrt(x+16)
# plot f(x) ls 1
plot f(x) ls 1,g(x) ls 2, h(x) ls 3
```