Math 113 worksheet 3.1a Functions and Graphs DUE _____

1. Sketch the graph of a function *f* which meets the following five conditions:
$f(-6)=0$, $f(0)=5$, $f(4)=-3$, *f* increases over the intervals $(-\infty, 2)$ and $(4, \infty)$, *f* decreases over the interval $(2, 4)$.

2. (a) Write the equation of a quadratic function whose vertex is $(-2, 4)$ and whose graph opens upward.
(b) Write the equation of a quadratic function whose vertex is $(-2, 4)$ and whose graph opens downward.
(c) Which of the two functions above has a maximum value, and what is that maximum value?

3. For each of the following functions, first state the domain and then determine (algebraically—you *must* show your work to receive full credit) whether the function is even, odd, or neither.

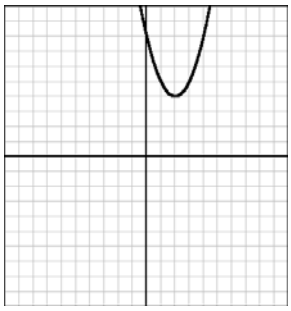
(a) $f(x)=\sqrt{16-x}$ (b) $f(x)=\sqrt{16-x^2}$ (c) $f(x)=\dfrac{x}{|x|}$ (d) $f(x)=x^3-x$ (e) $f(x)=x^3-x^2$

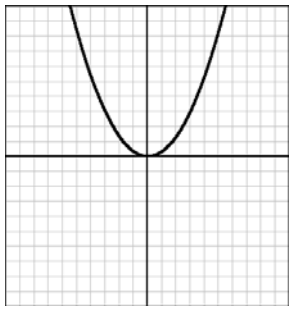
4. Sketch the graphs of functions 3a), 3b) and 3c). Find and label *all* intercepts. *Hint*: Do a table of values based on your domain work above.

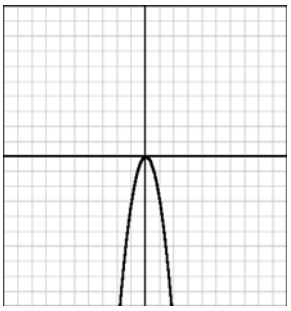
5. Match each function (a through h) with the correct graph (m through t). State how you know your choice is correct.

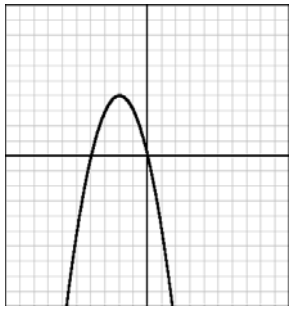
(a) $y=(x-2)^2+4$ (b) $y=-(x+2)^2-4$ (c) $y=(x-2)^2-4$ (d) $y=-(x+2)^2+4$

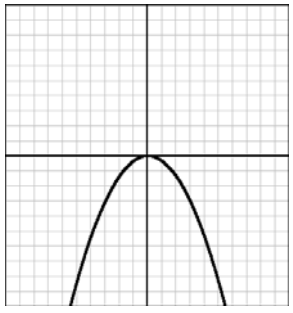
(e) $y=3x^2$ (f) $y=-3x^2$ (g) $y=\dfrac{1}{3}x^2$ (h) $y=-\dfrac{1}{3}x^2$

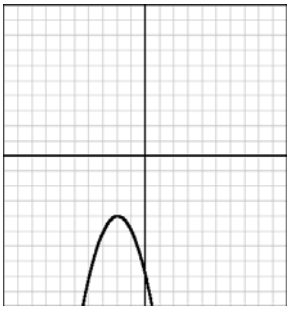
(m) 

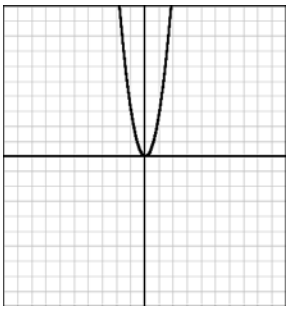
(n) 

(o) 

(p) 

(q) 

(r) 

(s) 

(t)