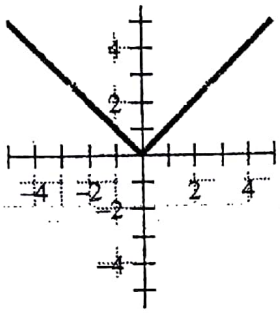
Symmetry

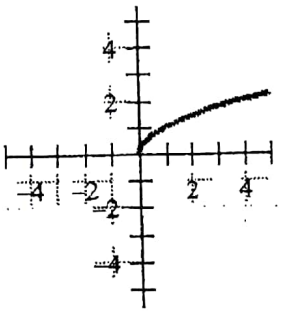
Name:_____

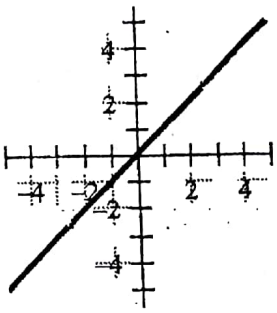
1. If a function is even, its graph is symmetric with respect to the Y-axis.
   This also means that $f(-x) = f(x)$ $(x,y) \rightarrow (-x,y)$

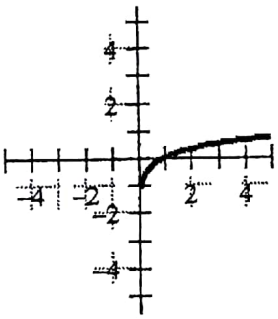
2. If a function is odd, its graph is symmetric with respect to the origin.
   This also means that $f(-x) = -f(x)$ $(x,y) \rightarrow (-x,-y)$

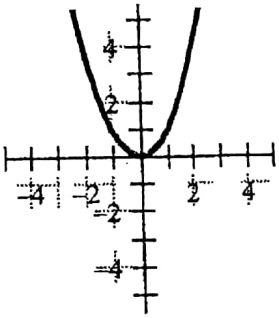
Determine whether each function graphed is even, odd, or neither

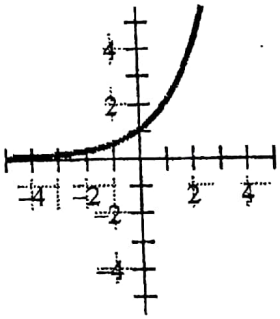
___3. 

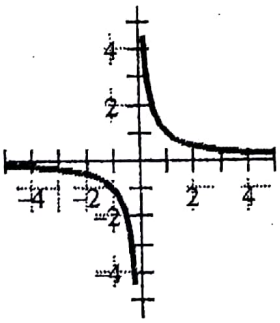
___4. 

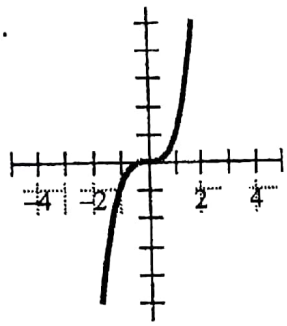
___5. 

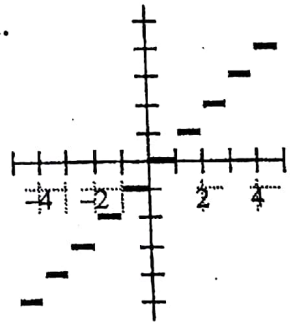
___6. 

___7. 

___8. 

___9. 

___10. 

___11. 

- substitute $-x$ for x & simplify
- $f(-x)$ → $f(x)$ even (everything is same)
- $f(-x)$ → $-f(x)$ odd (everything is opposite)

(DO NOT plug in a number, plug in $-x$!!)

Determine algebraically whether each of the following functions is even, odd or neither.

EX 1 $f(x)=4x+5$

$f(-x)=4(-x)+5$

$f(-x)=-4x+5$

neither

EX 2 $f(x)=x^3-x$

$f(-x)=(-x)^3-(-x)$

$=-x^3+x$

$=-f(x)$ odd

EX 3 $f(x)=x^2-6$

$f(-x)=(-x)^2-6$

$=x^2-6$

$=f(x)$

even

15. $f(x)=x^3-x-2$

16. $f(x)=\dfrac{x^4-x}{x^5-x}$

17. $f(x)=\dfrac{x^3-x}{x^5}$

18. $f(x)=(x-4)^2$

19. $f(x)=x^4-x^2+4$