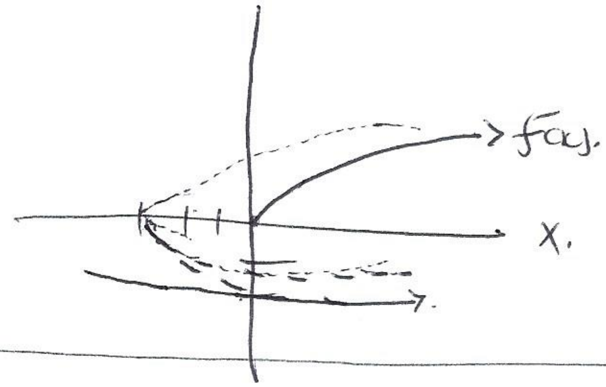
Enock Ofori
MATH 2311
Pre-Calculus I
Ms. Palmer

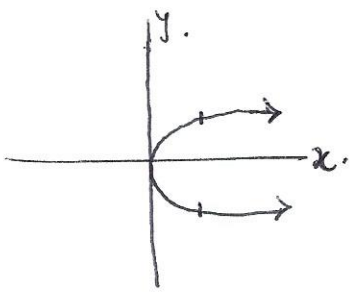


09/12/2018.

1.7. Evaluating functions and Piece-wise functions.

Tests for symmetry:

Symmetry with respect to the x-axis.



Ex: $x + y^2 = 4.$

same

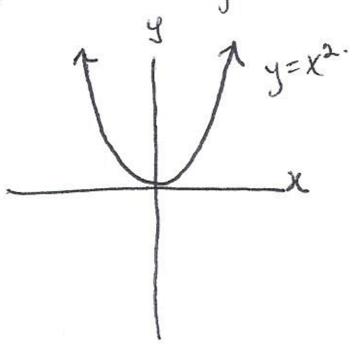
Test: Plug in $y = -y$.

$\Rightarrow x + (-y)^2 = 4.$

$x + y^2 = 4.$

The graph of this equation is symmetric about the axis.

Symmetry with respect to the y-axis.



Test: $x = -x$.

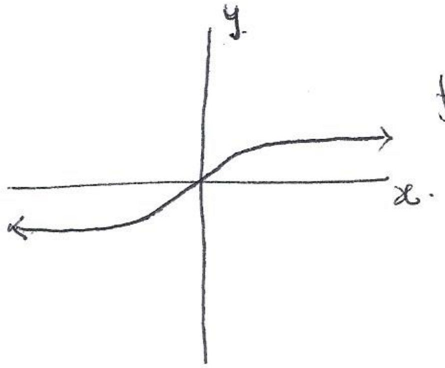
Ex: $y = x^2 - 3.$

$y = (-x)^2 - 3.$

$y = x^2 - 3.$

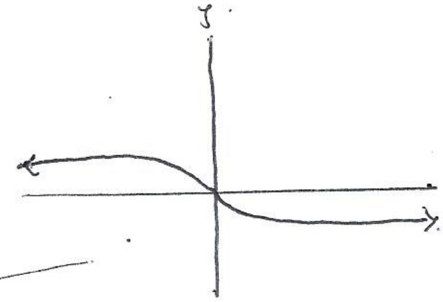
The graph of this function is symmetric about the y-axis.

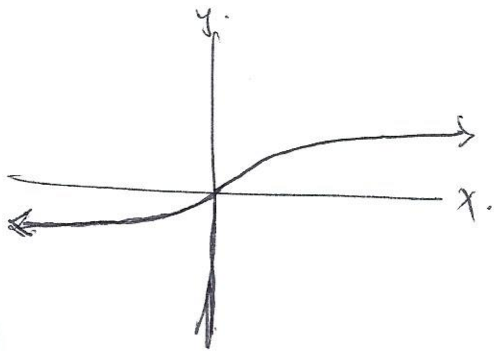
Symmetry with respect to the origin.



$f(x) = \sqrt[3]{x}$

Y-axis





test : $x = -x$

$y = -y$

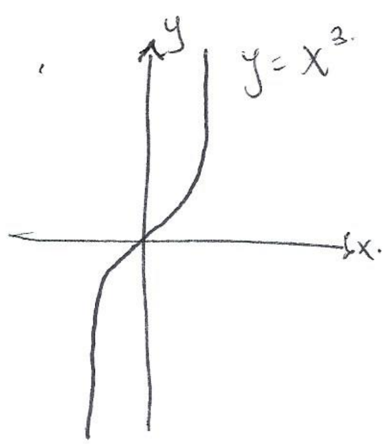
Ex: $y = x^3$

$-y = (-x)^3$

$\frac{-y}{-1} = \frac{-x^3}{-1}$

$y = x^3$

same.



$y = x^3$

If a function is symmetric about the y-axis, it is an even function.

If a function is symmetric about the origin, it is an odd function.

Determine whether the given function is even, odd, or neither.

$f(x) = 2x^2 - 3x + \sqrt{x}$.

Test for Even: $f(x) = f(-x)$. not the same.

$\Rightarrow 2(-x)^2 - 3(-x) + \sqrt{-x}$

$\Rightarrow 2x^2 + 3x + \sqrt{-x}$

odd: $f(x) = -f(-x)$.

$-y = 2(-x)^2 - 3(-x) + \sqrt{-x}$.

$-y = 2x^2 + 3x + \sqrt{-x}$.

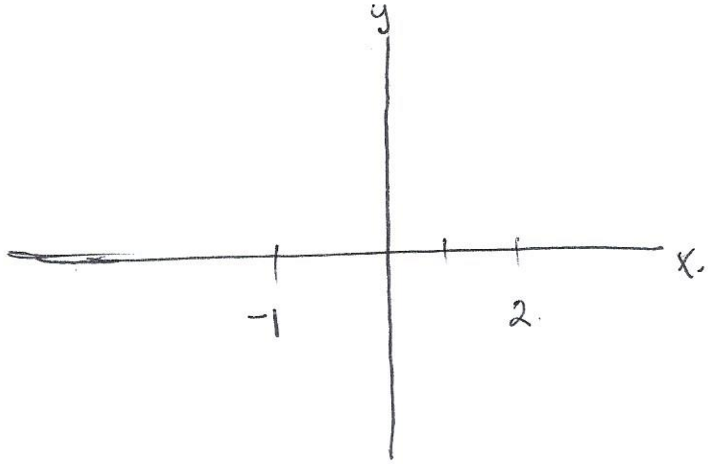
$y = -2x^2 - 3x - \sqrt{-x} \neq 2x^2 - 3x + \sqrt{x}$.

$f(x)$ not odd.

$f(x)$ is neither.

Piece-wise Functions.

Ex: $f(x) = \begin{cases} (x+2)^2, & \text{for } x < -1 \\ -3, & \text{for } -1 \leq x \leq 2. \\ |x+1|, & \text{for } x \geq 2. \end{cases}$



Evaluate $f(-3) = (-3+2)^2 = (-1)^2 = 1$.

$\boxed{f(-3) = 1}$

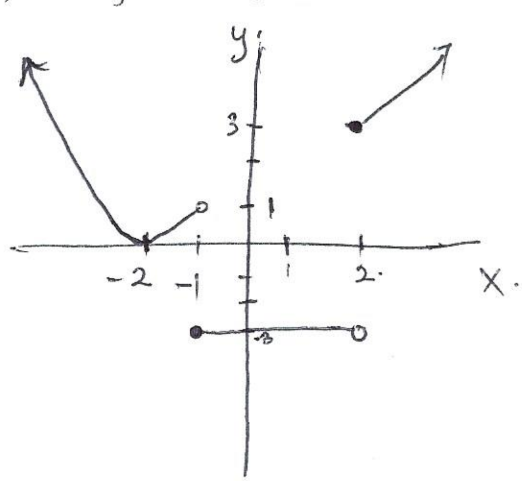
$f(5) = |5+1|$

$\boxed{f(5) = |6| = 6}$

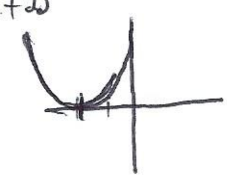
$\boxed{f(0) = -3}$

Sketch the graph of $f(x)$

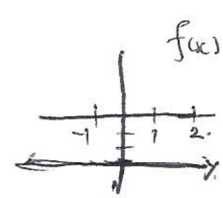
$$f(x) = \begin{cases} (x+2)^2, & \text{for } x < -1 \\ -3, & \text{for } -1 \le x < 2 \\ |x+1|, & \text{for } x \ge 2 \end{cases}$$

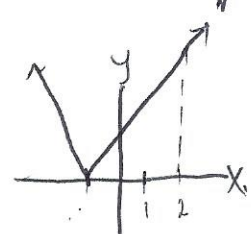


$(x+2)^2$



$f(x) = -3$





$f(x) = |x+1|$