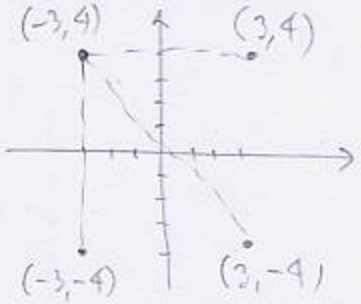
College Algebra — Joysheet 6
MAT 140, Fall 2012 — D. Ivanšić

Name: Saul Ocean

Show all your work!

1. (4pts) Find the points symmetric to point $(-3, 4)$ with respect to:

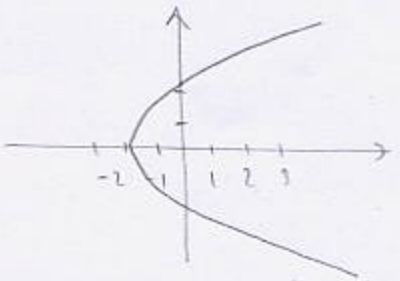
x-axis	y-axis	the origin.	Draw a picture.
$(-3,-4)$	$(3,4)$	$(3,-4)$	

2. (12pts) Check algebraically whether the graph of $y^2 - 3x = 5$ is symmetric with respect to the x-axis, y-axis, or the origin. Then use the calculator to draw the graph and verify your conclusions.

x-axis	y-axis	origin
$(-y)^2 - 3x = 5$	$y^2 - 3(-x) = 5$	$(-y)^2 - 3(-x) = 5$
$y^2 - 3x = 5$	$y^2 + 3x = 5$	$y^2 + 3x = 5$
same	not same	not same
symm.	no symm.	no symm.

$y^2 = 3x + 5$

$y = \pm\sqrt{3x+5}$



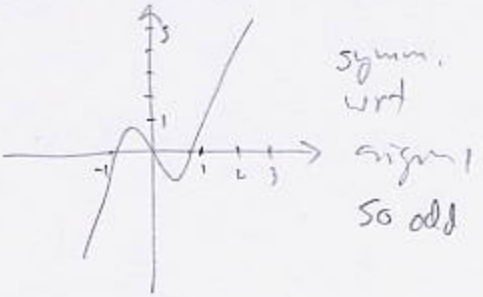
yes, symm. wrt x-axis

3. (14pts) For the following functions, determine algebraically whether they odd, even, or neither. Then use the calculator to draw their graphs and verify your conclusions.

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

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

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



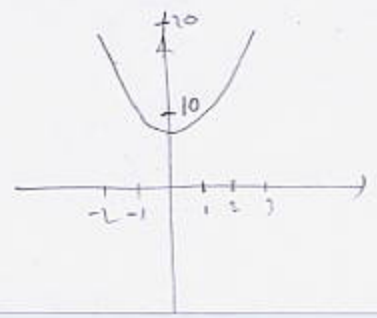
symm. wrt origin

So odd

$g(x) = x^2 + |x| + 7$

$g(-x) = (-x)^2 + |-x| + 7 = x^2 + |x| + 7 = g(x)$

even

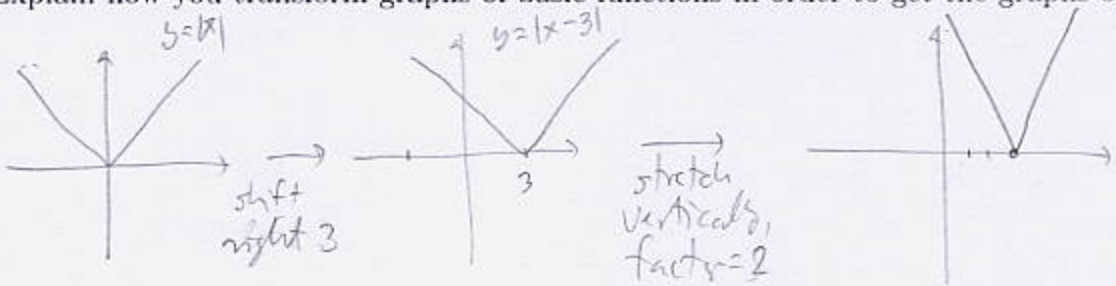


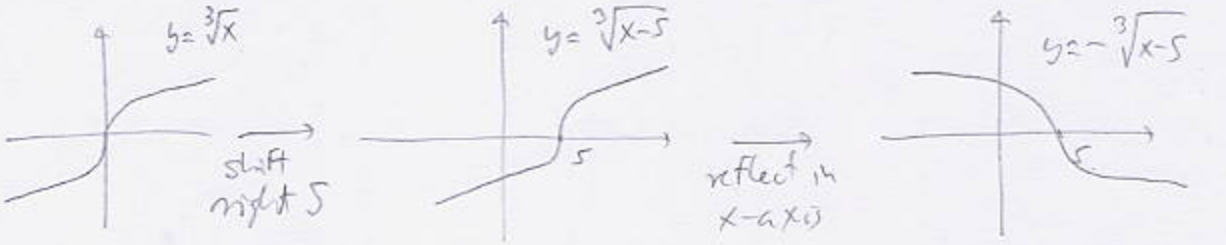
symm. wrt. y-axis

So even

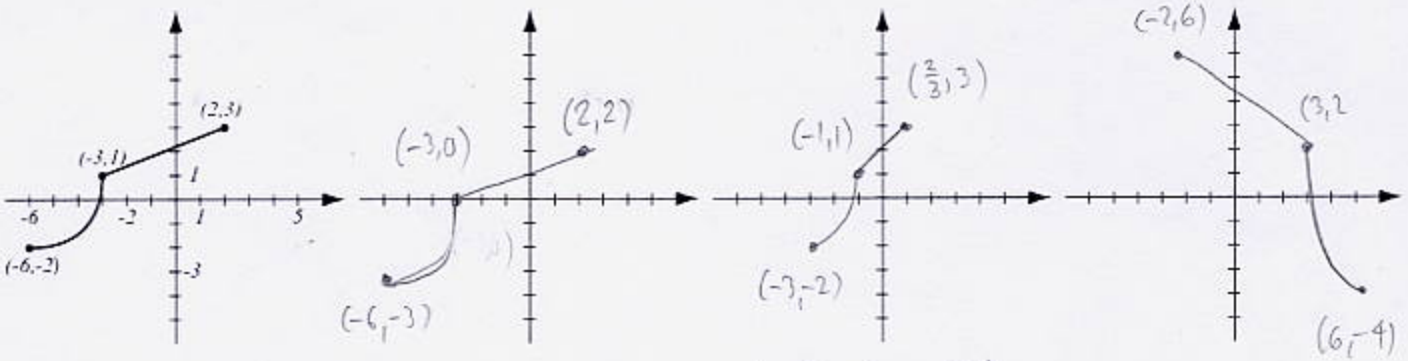
$= -\sqrt[3]{x-5} + 4$

4. (16pts) Using transformations, draw the graphs of $f(x) = 2|x-3|$ and $g(x) = 4 - \sqrt[3]{x-5}$. Explain how you transform graphs of basic functions in order to get the graphs of f and g.





5. (14pts) The graph of $f(x)$ is drawn below. On three separate graphs, sketch the graphs of the functions $f(x) - 1$, $f(3x)$ and $2f(-x)$ and label all the relevant points.



shift down 1

$(x,y) \to (x,y-1)$

stretch horizontally, factor $= \frac{1}{3}$

$(x,y) \to (\frac{1}{3}x, y)$

reflect in x-axis, stretch vertically, factor = 2

$(x,y) \to (-x,y) \to (-x,2y)$