

Mathematics 251, LOS, Quiz 1, Week of Sept. 22, 2003

NAME _____

SIGNATURE _____

Let $f = f(x)$ be an odd function and let $g = g(x)$ be even.

3 Answer the following questions as TRUE or FALSE

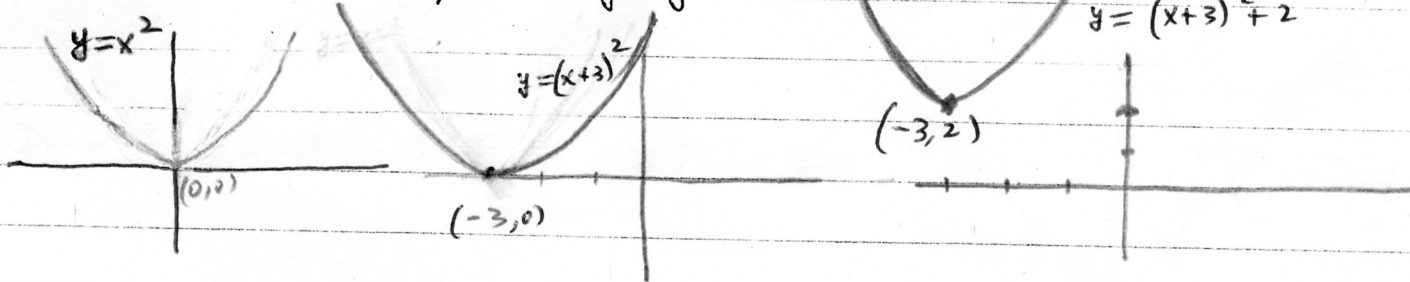
(a) The function $\frac{f}{g}$ must be odd TRUE

(b) The function $f+g$ must be even FALSE

(c) The function $g \circ f$ must be even TRUE

3 If the slope of the line joining the point $(2,2)$ to the point $(3,y)$ is 4 then $y = \underline{6}$

3 Sketch the graph of $y = 2 + (x+3)^2$ by appropriately modifying the graph of $y = x^2$



4 Let $f(x) = \frac{2x-3}{x-2}$, $x \neq 2$

3 (a) Find the range of f all $y \neq 2$

$$y = \frac{2x-3}{x-2}, \quad yx - 2y = 2x - 3, \quad x(y-2) = 2y-3, \quad x = \frac{2y-3}{y-2}$$

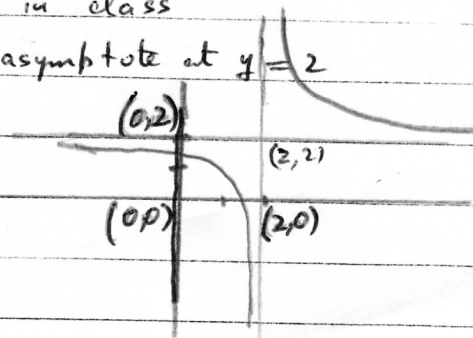
(b) Sketch the graph of $y = \frac{2x-3}{x-2}$, $x \neq 2$

This is a hyperbola as discussed in class

Vertical asymptote at $x = 2$, Horizontal asymptote at $y = 2$

OR $y = \frac{2x-4+1}{x-2} = \frac{2x-4}{x-2} + \frac{1}{x-2}$

$\therefore y = 2 + \frac{1}{x-2}$ etc



3 Let $f(x) = \frac{1+x}{1-x}$, $g(x) = \frac{x}{1-x}$

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(a) Find a formula for $f \circ g$

$$(f \circ g)(x) = f\left(\frac{x}{1-x}\right) = \frac{1 + \frac{x}{1-x}}{1 - \frac{x}{1-x}} = \frac{1}{1-2x}$$

(b) What is the domain of $f \circ g$?

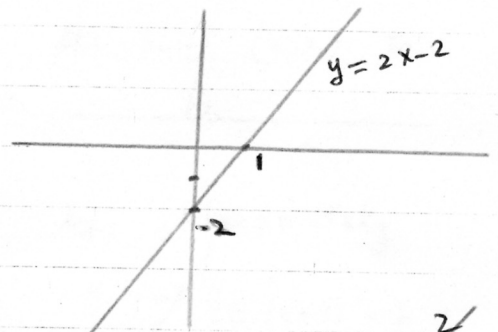
Domain of g is all $x \neq 1$

Domain of $f \circ g$ is all $x \neq 1, \frac{1}{2}$

6 If $x = -3.141$ then $\sqrt{x^2} = \underline{\underline{3.141}}$

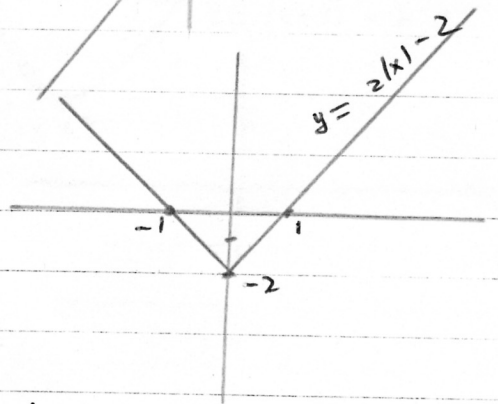
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(a) Draw the graph of $y = 2x - 2$

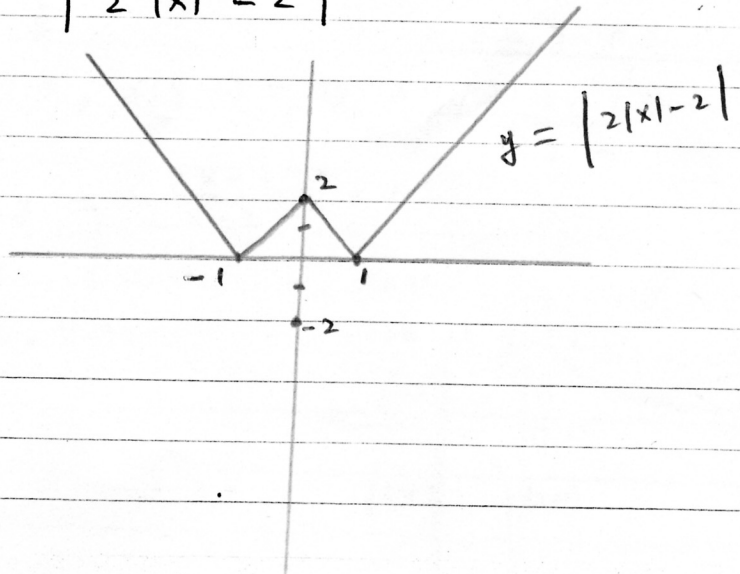


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(b) Draw the graph of $y = 2|x| - 2$



(c) Draw the graph of $y = |2|x| - 2|$



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