I Composition and Inverse functions Il Composition Defin: Let f(x) and g(x) be functions. The composition of f with f is (f. g(x) - f(g(x)). Egi Of(x)=x2+ Zx+T1, g(x)=x3. $(f \circ g)(x) = f(g(x)) = f(x^3) = (x^3)^2 + 2(x^3) + 77$ = $x^6 + 2x^3 + 77$. (2) f(x) = f(x), g(x) = f(x)Gof X(x) = ten (Jx+1) Znot obelian! Of(x)= /x, g(x) = sin(x) (fog 1(x) = /sin(x) = cre(x). (1) f(x) = 1/42, g(x) = x2-1 $(f \circ g)(x) = \frac{1}{x^2 + 1}$ $(g \circ f)(x) = (\frac{1}{x+2})^2 - 1 = (\frac{1}{x+2})^2 - 1$ 5 f(x)=x2, g(x)-sin(x), b(x)=2x+1 (fogohtx) = sin2(2x+1) 6 f(x)= x3, g(x) = cos(x), h(x) = \(\frac{1}{x}\), \(\frac{1}{x}\) = \(\frac{1}{x}\), \(\frac{1}{x}\) = \(\frac{1}{x}\). (7) f(x1 = cos(x), g(+1 = t²) (change of variables)

7.2 The Idea of Inventes Defa: Let f(x) and q(x) be functions We say

f and g are inverses of one another if

fog = 1 and gof = 1 (f(g(x)) = x, q(f(x)) = x).

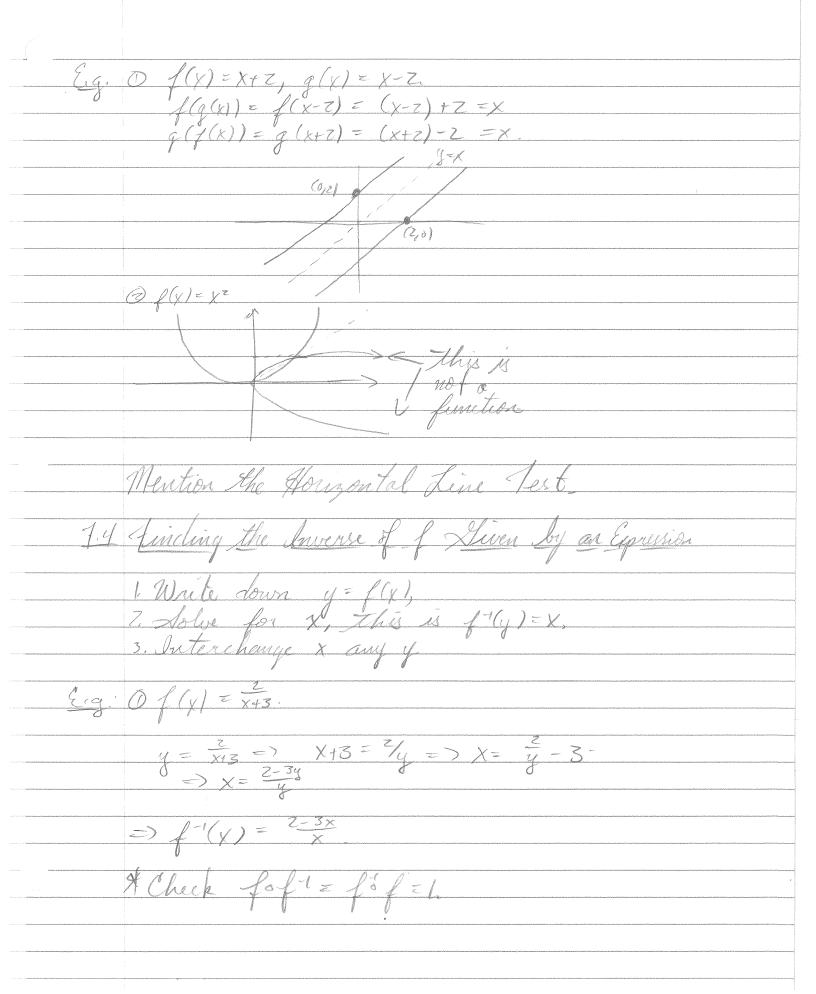
We denote this relationship by g = f' or f = g'. Pink: O this is not a power f'(x) + 'far. The domains here are important. $f(x) = x^{2} \text{ is invertible over } E_{0}, \infty).$ $f'(x) = \int x \text{ (There is exactly one positive square root of any real number). Governer, this is not the case over <math>(-\infty, \infty)$; f does not have an inverse here $\int (-\infty, \infty)^{2} = \int y = 2 \neq -2$ 7.3 Finding the Inverse of of Given by a Graph Let f be a function Its graph is
the set of points (x, f(x)) We graph

of f are the set of points

(f(x), f' o f(x)) = (f(x), x).

So the graph of f' is the graph of

with the coordinates reversed. This is a reflection arrows the live y=x.



(b)	Juvet $f(x) = \sqrt[3]{2x+1}$ $y = \sqrt[3]{2x+1}$ $\Rightarrow y^3 = 2x+1$ $\Rightarrow y^3 - 1 = x$
	$y = \sqrt[3]{z_{x+1}}$
	$=) y^3 = 2x+1$
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r dimministrator resident privince in consensation and consensation and communication and consensation and c	$=\int_{-\infty}^{\infty} f(x) = \frac{x^2}{2}$
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-militari mananaini, baami matiisaani katalahai kanalahiitaa Tilaayaya ayaajii (Tilaisaa katal	$f(x) = x^{4} - 3$ $= x^{4} - 3$ $= x^{4} + 3 = x^{4}$ $= x^{4} + 3 = x$
-menek inimboniya spanobi bibili imake kibo oyan najpokabali kibanyiyin kibina sanok kibo wi kibin	$y = x^{4-3}$
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