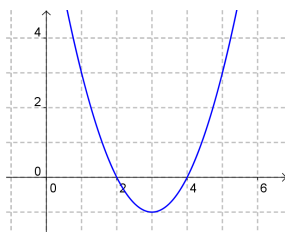


Unit 2 Review - Functions & Relations

A. Relations

- relate dependent (y) and independent (x) variables
- points (x, y), graph, equation, set
- domain (set of x) and range (set of y)

x	y
1	1
2	4
3	9



$$y = -2x + 5$$

$$y = 3(x - 2)^2 - 1$$

$$x^2 + y^2 = 25$$

$\{(1, 1), (2, 4), (3, 9)\}$

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B. Functions

- each x-value has only one y-value

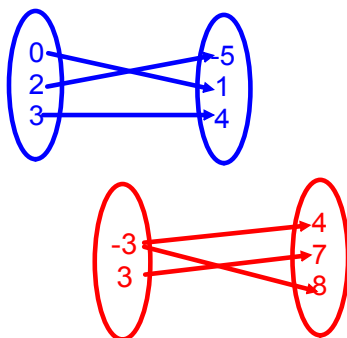
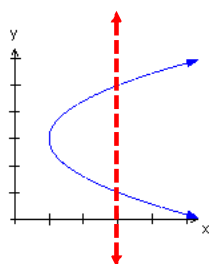
graph: vertical line test

set (of points): each x-value occurs only once

mapping diagram: only one arrow from each domain value

equation: sub any value for x, produces one y

(look out for \pm indicating two y-values)



$$x^2 + y^2 = 25$$

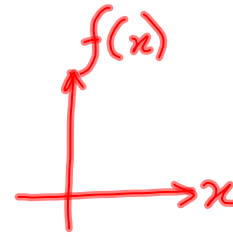
$$y^2 = 25 - x^2$$

$$y = \pm\sqrt{25 - x^2}$$

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C. Function Notation

- $f(x)$ takes the place of 'y' in equations
- $f(a)$ means "set $x = a$ in equation"
- graphing, the y-axis can be labelled as $f(x)$

x-y notation

$$y = 3x + 2$$

$$\text{sub } x = 1$$

$$y = 3(1) + 2$$

$$= 5$$

function notation

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

$$f(1) = 3(1) + 2$$

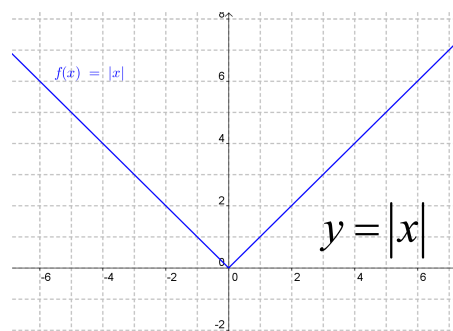
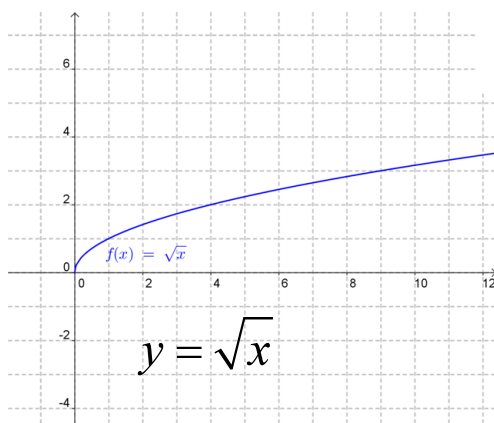
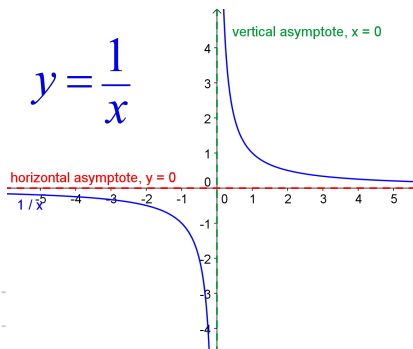
$$= 5$$

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D. New Functions

- radical
- reciprocal
- absolute value

$$y = \frac{1}{x}$$



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E. Inverse Functions

- a function and its inverse undo each other

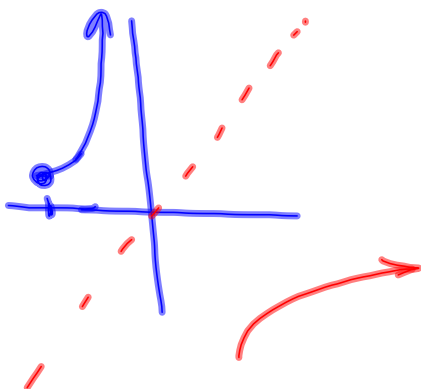
points: swap x- and y-coordinates

graph: reflection using the line $y = x$

equation: swap x and y, solve for y

- special notation if the inverse is a function $f^{-1}(x)$

- possible to restrict the domain of the original function to force the inverse to also be a function



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F. Transformations of Functions $y = a f[k(x - p)] + q$

1. vertical scaling by a for $a \neq 1$
(v. reflection for $a < 0$)
2. horizontal scaling by $1/k$ for $k \neq 1$
(h. reflection for $k < 0$)
3. horizontal translation by p
4. vertical translation by q

$$(x, y) \rightarrow \left(\frac{x}{k} + p, ay + q \right)$$

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Suggested Work:

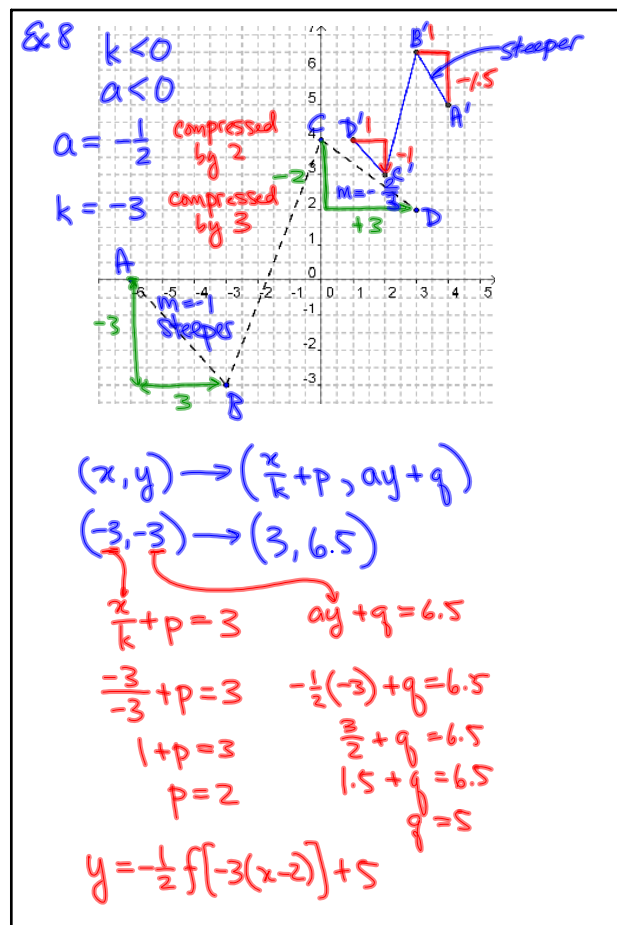
read unit notes

look through text, particularly examples

revisit assigned work from each lesson

attempt review worksheets

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Mar 7-2:23 PM