

Panel 1

Science Calculus 1

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Panel 2

Grading

Quizzes every week: 100 p

3 exams: 300 p

1 final: 100 p

Computer assignments: 100 p

600 p.Course Content:

Functions, Limits, Continuity

Derivatives

Applications

Integration

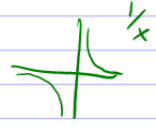
Inverse functions

2

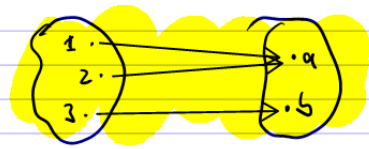
Panel 3

Functions

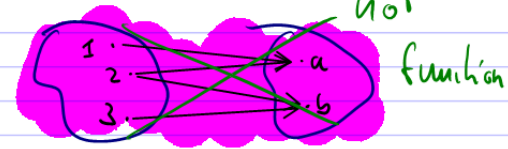
Def: A function is a rule that assigns to each element x in a set A exactly one element y , or more commonly $y=f(x)$, in a set B .

Note: The set A is called: DOMAIN 
 The set B is called: RANGE

Ex: $f(x) = x^2$ $R = \mathbb{R}^+$
 $D = \mathbb{R}$

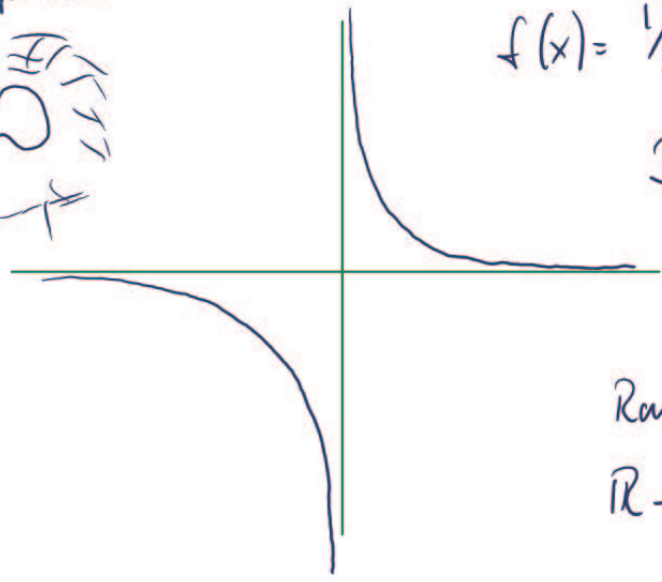


HW $\rightarrow g(x) = \frac{1}{x-1}$ $D = \mathbb{R} - \{0\}$



$k(x) = 5$ $D = \mathbb{R}$

Panel 4



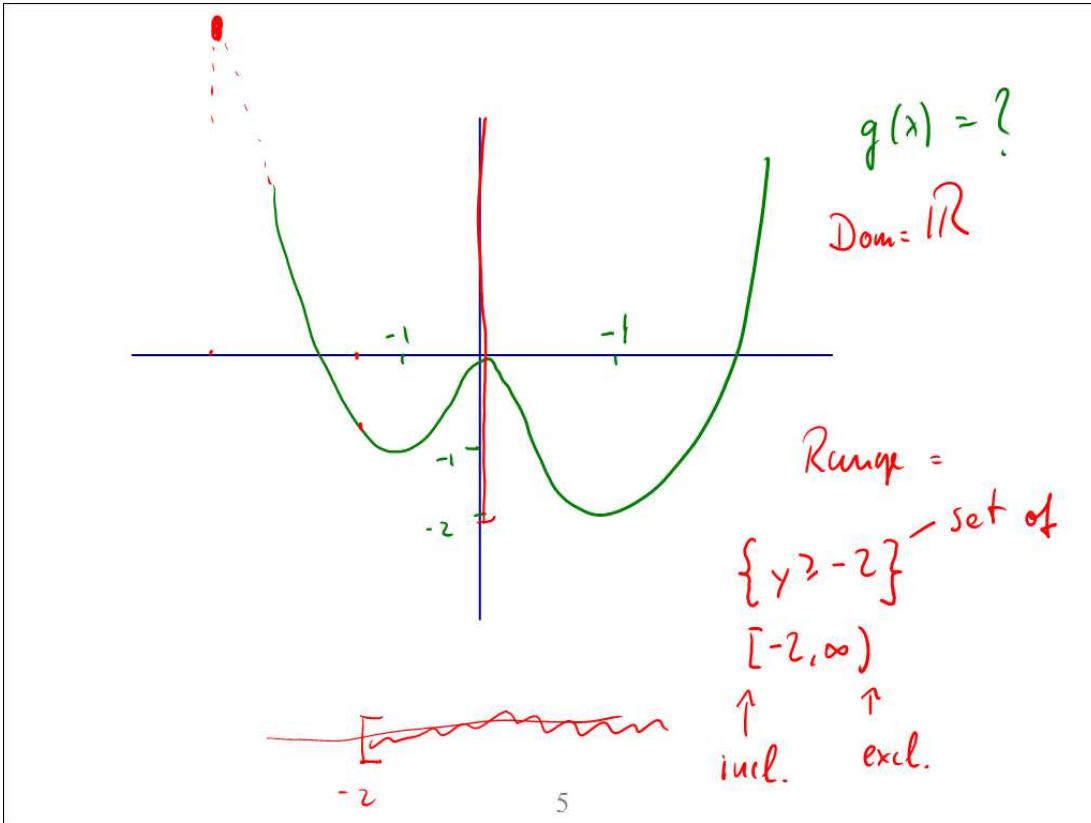
$f(x) = \frac{1}{x}$



Domain: $\mathbb{R} - \{0\}$

Range: $\mathbb{R} - \{0\}$

Panel 5



Panel 6

Representing a function

4 different ways:

- verbally
- numerically (table)
- graphically ⊗
- algebraically ⊗

Ex: Domain of $f(x) = \sqrt{x+2}$ $x+2 \geq 0$
 $x \geq -2$ Domain

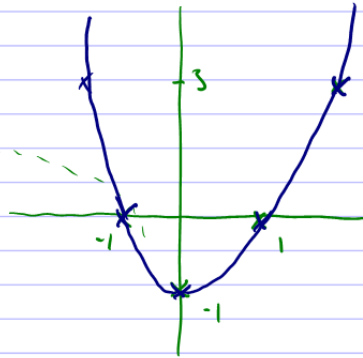
$g(x) = \frac{1}{x^2-x}$ Domain = $\mathbb{R} - \{0, 1\}$

Domain $x^2-x = 0$ problem
 $x(x-1) = 0$ if $x=0$ or $x=1$

Panel 7

Sketch $f(x) = x^2 - 1$

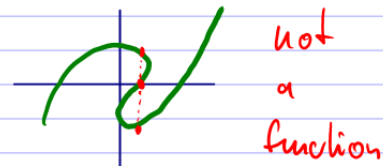
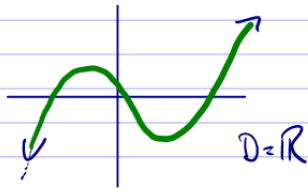
x	y
-2	3
-1	0
0	-1
1	0
2	3



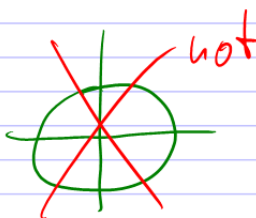
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Panel 8

Not every graph represents a function:



Vertical line test: if no vertical line intersects a graph more than once, it's a function



8

Panel 9

Piecewise defined functions:

$$f(x) = \begin{cases} 1-x & \text{if } x \leq 1 \\ x^2 & \text{if } x > 1 \end{cases}$$

$f(0) = 1$

$f(1) = 0$

$f(2) = 4$

Sketch this

$1-x$

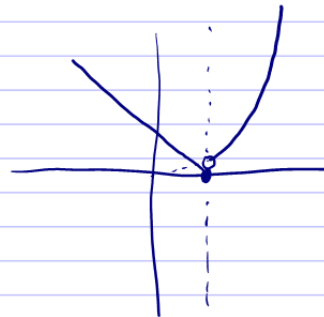


x^2



is this right?

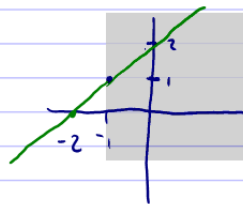
HW



Panel 10

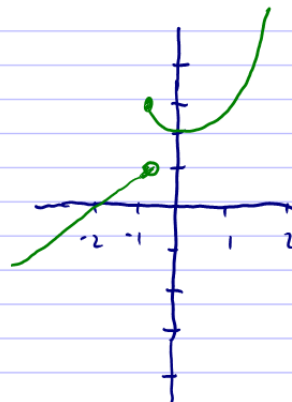
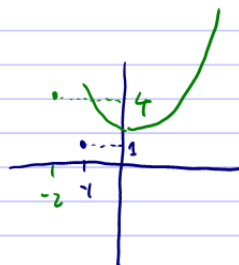
$$f(x) = \begin{cases} x+2 & \text{if } x < -1 \\ x^2+2 & \text{if } x \geq -1 \end{cases}$$

① $x+2$






③ Piece together.

② x^2



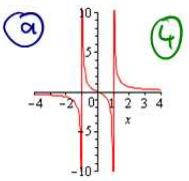
Panel 11

A Function Catalog

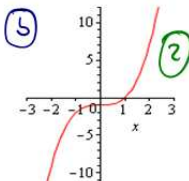
- ✓ linear
- ✓ power ($x^2, x^3, x^4, x^5, x^6, 7x^7, 9x^8, \dots$)
- ✓ polynomials ($x^5 + 7x^2 - 9x + 103$)
- rationals ($\frac{x-7}{x^2+9x+5}$) asymptotic 
- (~~Roots~~)
- trig repeat  grows fast
- logs + exp cbre  grows slow

11

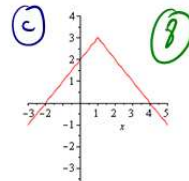
Panel 12



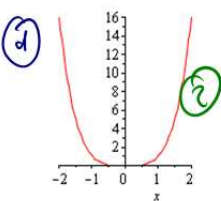
(a) (4)



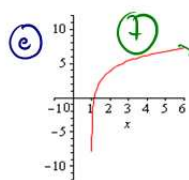
(b) (2)



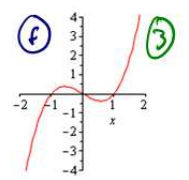
(c) (8)



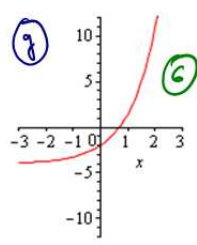
(d) (2)



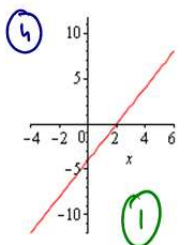
(e) (7)



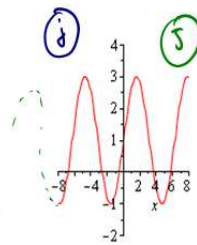
(f) (3)



(g) (6)



(h) (1)



(i) (5)

Who's Who?

- 1 linear
- 2 power
- 3 polynomial
- 4 rational
- 5 trig
- 6 exp
- 7 log
- 8 other

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Panel 13

