

Panel 1

Welcome to Math 1303



Abducted by an alien circus company, Professor Doyle is forced to write calculus equations in center ring.

Quantitative Methods
for Business

or

Business Calculus

Panel 2

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HW #1: Download Dykrow

HW #2: Buy textbook

Panel 3

Grading

| | |
|-----------------------|------------|
| Quizzes every week: | 125 points |
| 3 exams: | 300 points |
| 1 final: | 250 points |
| Computer assignments: | 125 points |
| | <u>800</u> |

About the final:

- cumulative + difficult
- computer portion + regular portion
- counts a lot
- dept. final

Be prepared!

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Panel 4

What is covered in Business Calc ↙ calculus

① Suppose it costs \$500 to produce x widgets with fixed costs of \$1,250. Assuming a marginal revenue of \$750 per unit, how many units to produce for max. profit (or min. cost)

② To purchase a home you borrow \$200,000 from the bank at 4.0 % interest fixed over 30 years. How much is monthly payments, and how much do you pay to the bank in total? ↙ financial math \$350,000

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Panel 5

What is covered in Business Calc?

| | | |
|----|---------------------------------------|------------|
| 2 | Functions and Graphs | } Review |
| 3 | Lines, Parabolas and Systems | |
| 4 | Exponential and Logarithmic Functions | } new |
| 5 | Mathematics of Finance | } calculus |
| 10 | Limits and Continuity | |
| 11 | Differentiation | |
| 12 | Additional Differentiation Topics | |
| 13 | Curve Sketching | |
| 14 | Integration | |
| 6 | Matrix Algebra | |

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Panel 6

About DyKnow

Downloaded by now - install

Dyknow Server Address:

dyknow://vision.dyknow.com/stm.edn

Your username: 8-letter SS name

Your password: username

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Panel 7

Functions

Def: A function is a rule that assigns to every x in a set A (input) exactly one element $y = f(x)$ from a set B (output)

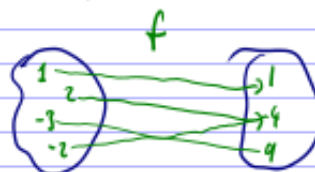
Note: The set A is called: domain

The set B is called: range

Ex: $f(x) = x^2$

$g(x) = \frac{1}{x-1}$

$k(x) = 5$ constant



Panel 8

Representing a function

- 4 different ways:
- verbally
 - numerically
 - algebraically *
 - geometrically *

Ex: Find domain $f(x) = x^2 + 1$ $D = \text{all numbers, } \mathbb{R}, (-\infty, \infty)$

$g(x) = \frac{1}{x^2 + 1}$ $D = \mathbb{R}$

$h(x) = \frac{1}{x^2 - x}$ bad: $x^2 - x = 0$ $D = \mathbb{R} - [0, 1]$
 $x(x-1) = 0$

$k(x) = +\sqrt{x+2}$ want: $x+2 \geq 0$ $D = \{x \geq -2\}$

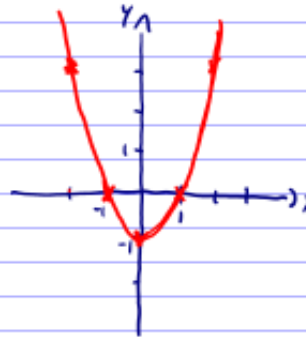
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Graph of a function

The graph of a function $y = f(x)$ is the collection of ordered pairs (x, y) , where $y = f(x)$, drawn in a Cartesian coordinate system.

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

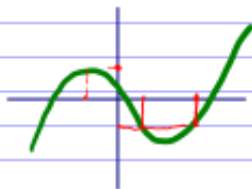
| x | f(x) |
|----|------|
| -2 | 3 |
| -1 | 0 |
| 0 | -1 |
| 1 | 0 |
| 2 | 3 |



domain / range
 \mathbb{R} $[-1, \infty)$

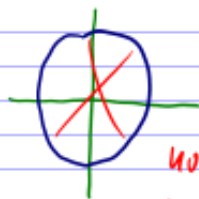
Panel 10

Not every graph represents a function:



if and only if

Vertical Line Test: a graph represents a function iff
 no vertical line intersects graph more than once.



not a function



Panel 11

Domain / Range Graphically:

Domain: all x-values you are allowed to plug in (x-axis)

Range: all values that originate from some x-value (y-axis)

Panel 12

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 $f(x)$