

Introduction to Math for Political Scientists

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Fall 2015

Welcome to UT!

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- And to Math Camp!

Math Camp (tentative) schedule

- Today: Arithmetic, functions

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- Tomorrow: Functions (cntd), Calculus

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- Tuesday: Wrap up (and catch-up), student panel, pizza par-tay

Let's start real slow...

- So we all know that

$$2 + 2 = 4$$

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- So we all know that

$$2 + 2 = 4$$

- But addition and subtraction have some cool (groot?) rules

Properties of Addition and subtraction

- Communicative:

Properties of Addition and subtraction

- Commutative:
 - $a \pm b = b \pm a$

Properties of Addition and subtraction

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 - $a \pm b = b \pm a$
- Associative

Properties of Addition and subtraction

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- $a \pm b = b \pm a$

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- $(a \pm b) \pm c = a \pm (b \pm c)$

Multiplication

- Multiplication - I have these 4 things 10 times.

$$4+4+4+4+4+4+4+4+4+4$$

[1] 40

Multiplication

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Multiplication

- Multiplication - I have these 4 things 10 times.

$$4+4+4+4+4+4+4+4+4+4$$

[1] 40

Or I could just do

$$4*10$$

[1] 40

Division

- Just fancy multiplication.

Division

- Just fancy multiplication.

Division

- Just fancy multiplication.
- I have these four things one of ten times.

$$4 * (1/10)$$

[1] 0.4

Properties of Multiplication and Division

- Communicative

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- Communicative
 - $a * b = b * a$

Properties of Multiplication and Division

- Communicative
 - $a * b = b * a$
- Associative

Properties of Multiplication and Division

- Communicative
 - $a * b = b * a$
- Associative
 - $(ab)c = a(bc)$

Properties of Multiplication and Division

- Communicative
 - $a * b = b * a$
- Associative
 - $(ab)c = a(bc)$
- Distributive

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- Communicative
 - $a * b = b * a$
- Associative
 - $(ab)c = a(bc)$
- Distributive
 - $a(b + c) = ab + ac$

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- $a * b = b * a$

- Associative

- $(ab)c = a(bc)$

- Distributive

- $a(b + c) = ab + ac$

- Note that this works for division: $\frac{a + b}{c} = \frac{a}{c} + \frac{b}{c}$

Relationships that hold with (real) numbers

- $a = b \iff b = a$ (Symmetric relationships)

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- $a = b \iff b = a$ (Symmetric relationships)
- $a = b$ and $b = c \Rightarrow a = c$ (Transitive relationships)
 - $a > b$ and $b > c \Rightarrow a > c$

PEMDAS

- Parentheses

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- Parentheses
- Exponents

PEMDAS

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- Exponents
- Multiplication and division (left to right)

PEMDAS

- Parentheses
- Exponents
- Multiplication and division (left to right)
- Addition and subtraction (left to right)

$$(10 - 48 \div 12 * 2)^2 + 3^2 * (8 - 6)$$