Abbreviations for Mathematics
Special Rules

#7 of Gottschalk's Gestalts

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of the Organization & Exposition
of Mathematics
by Walter Gottschalk

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500 Angell St #414
Providence RI 02906

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☐ comment
a good general principle
in the consideration of abbreviations is that
meaning is a function of custom & context;
eg
in some context it may happen that
abs = absolute & ord = ordinal,
but in another context it may happen that
abs = abscissa & ord = ordinate;
indeed one may feel that
rules of abbreviation do not amount to much
and that
everything is a special case

☐ special rule
to abbreviate a word,
use the first letter

examples:

- angle.....a
- base.....b
- continuum-cardinal.....c
- degree.....d
- derivative.....D
- differential.....d
- face.....f
- genus.....g
- hour.....h
- indicator.....I

- meter.....m
- minute.....m
- page.....p
- per.....p
- quadrant.....Q
- radian.....r
- second.....s
- side.....s
- time.....t
- with.....w

☐ special rule
to abbreviate a word,
use the first two letters

examples:

- area.....ar
- axis.....ax
- characteristic.....ch
- element.....el
- equivalent.....eq
- even.....ev
- from.....fr
- identity.....id
- iterate.....it

- odd.....od
- operation.....op
- operator.....op
- plane.....pl
- projection.....pr
- space.....sp
- square.....sq
- where.....wh

☐ special rule
to abbreviate a word,
use the first three letters

examples:

- abscissa.....abs
- absolute.....abs
- abstract.....abs
- adjacent.....adj
- adjoint.....adj
- adjugate.....adj
- advanced.....adv
- algebra.....alg
- alternating.....alt
- altitude.....alt

- answer.....ans
- argument.....arg
- augmented.....aug
- automorphism.....aut
- bijection.....bij
- bimodal.....bim
- binomial.....bin
- bivariate.....biv

- calculus.....cal
- cartesian.....car
- category.....cat
- circle.....cir
- circumference.....cir
- column.....col
- commutative.....com
- conclusion.....con
- corollary.....cor
- covariance.....cov
- covariant.....cov
- cylinder.....cyl
- decimal.....dec
- declination.....dec

- definition.....def
- degree.....deg
- delta.....del
- denominator.....den
- dependent.....dep
- derivation.....der
- derivative.....der
- determinant.....det
- differential.....dif
- differentiate.....dif
- divergence.....div
- divergent.....div
- division.....div
- divisor.....div

- element.....ele
- endomorphism.....end
- estimate.....est
- euclidean.....euc
- figure.....fig
- filter.....fil
- finite.....fin
- general.....gen
- global.....glo
- harmonic.....har
- homomorphism.....hom
- horizontal.....hor
- hyperbolic.....hyp
- hypotenuse.....hyp
- hypothesis.....hyp

- inclination.....inc
- independent.....ind
- individual.....ind
- injection.....inj
- integer.....int
- integral.....int
- inverse.....inv
- isomorphism.....iso
- laplacian.....lap
- latitude.....lat
- lemma.....lem
- linear.....lin
- local.....loc

- minute.....min
- module.....mod
- modulo.....mod
- modulus.....mod
- morphism.....mor
- negation.....neg
- negative.....neg
- numerator.....num
- numerical.....num
- order.....ord
- ordinal.....ord
- ordinate.....ord

- period.....per
- polar.....pol
- population.....pop
- position.....pos
- positive.....pos
- potential.....pot
- quotient.....quo
- rational.....rat
- regular.....reg
- relation.....rel
- relative.....rel
- remainder.....rem
- revolution.....rev
- rotation.....rot

- saddle.....sad
- sample.....sam
- scalar.....sca
- second.....sec
- section.....sec
- segment.....seg
- sequence.....seq
- series.....ser
- solid.....sol
- solution.....sol

- sphere.....sph
- stationary.....sta
- straight.....str
- strict.....str
- structure.....str
- symbol.....sym
- symmetric.....sym
- synthetic.....syn
- tensor.....ten
- topology.....top

- valid.....val
- value.....val
- variable.....var
- variance.....var
- variation.....var
- vector.....vec
- vertical.....ver
- volume.....vol

☐ special rule
to abbreviate a word,
use the first four letters

examples:

- algorithm.....algo
- application.....appl
- calculus.....calc
- combination.....comb
- conjunction.....conj
- convergent.....conv
- critical.....crit
- diameter.....diam
- disjunction.....disj
- distance.....dist
- elementary.....elem
- eliminate.....elim

- fraction.....frac
- fundamental.....fund
- geodesic.....geod
- geometry.....geom
- gradient.....grad
- history.....hist
- imaginary.....imag
- inclination.....incl
- information.....info
- instantaneous.....inst
- longitude.....long
- measure.....meas
- mechanics.....mech
- multiplication.....mult

- perfect.....perf
- permutation.....perm
- perpendicular.....perp
- philosophy.....phil
- polynomial.....poly
- predicate.....pred
- probability.....prob
- problem.....prob
- projection.....proj
- projective.....proj
- property.....prop
- proposition.....prop

- quadrilateral.....quad
- rectangle.....rect
- retraction.....retr
- special.....spec
- statistics.....stat
- subject.....subj
- surface.....surf
- surjection.....surj
- trigonometry.....trig
- uniform.....unif
- universal.....univ

☐ special rule
to abbreviate a word,
use the first five letters

examples:

- associative.....assoc
- constant.....const
- coordinate.....coord
- denominator.....denom
- discriminant.....discr
- equivalence.....equiv
- homeomorphism.....homeo
- hypotenuse.....hypot
- individual.....indiv
- introduction.....intro
- numerator.....numer

☐ special rule
to abbreviate a word,
use the first letter and the last letter

examples:

- bound.....bd
- down.....dn
- foot.....ft
- left.....lt
- leg.....lg
- number.....nr
- point.....pt
- right.....rt
- yard.....yd

note: the abbreviation of number as no
comes from the Latin word for number viz
numerus (nominative case)
numero (ablative case);
since no is a word, nr is better
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☐ special rule
to abbreviate a word,
use the first letter,
one or more interior letters,
and the last letter

examples:

- analysis.....anls
- boundary.....bdy
- continuum.....contm
- complex.....cmx
- convex.....cnx
- equation.....eqn
- function.....fcn
- functional.....fcnl

- infinitesimal.....infl

(- infinity.....∞)

- mathematician.....mathn

- neighborhood.....nbd

- simplex.....smx

- theorem.....thm

☐ special rule
to abbreviate a word,
use the first letter and one or more interior letters

examples:

- class.....cls
- closure.....cls
- compact.....cmpc
- component.....cmpn
- curve.....crv
- gudermannian.....gd
- normal.....nrm
- signum.....sgn
- singular.....sng
- transitive.....trns
- ultrafilter.....ulf

☐ special rule
to abbreviate a word beginning with a consonant, drop the vowels

examples:

- chain.....chn
- dividend.....dvdnd
- domain.....dmn
- field.....fld
- foot.....ft
- formula.....frml
- group.....grp
- join.....jn

- large.....lrg
- last.....lst
- least.....lst
- line.....ln
- meet.....mt
- proof.....prf
- quantifier.....qntf
- range.....rng
- rank.....rnk
- real.....rl
- ring.....rng

- shape.....shp
- slope.....slp
- side.....sd
- strain.....strn
- tensor.....tnsr

note: some languages, such as Arabic & Hebrew, routinely do not write the vowels of words

☐ special rule
to abbreviate a word beginning with a consonant, use the first n consonants where n is up to 5 say

examples:

- derivative.....dr
- differentiate.....df
- border.....brd
- cardinal.....crd
- congruent.....cng
- discrete.....dsc
- disjoint.....dsj
- fundamental.....fnd
- manifold.....mnf
- proper.....prp

- small.....sml
- standard.....stnd
- stereographic.....strg
- stress.....strs
- strong.....strn
- substitution.....sbst
- theory.....thr
- transformation.....trnsf

☐ special rule
to abbreviate a word,
use the first letter of all/some of its syllables

examples:

- clockwise.....cw
- cosecant.....csc
- counterclockwise.....ccw
- piecewise.....pw
- steradian.....sr
- wellordered.....wo
- without.....wo

☐ special rule
to abbreviate a word,
use the first syllable

examples:

- average.....av
- axiom.....ax
- commutative.....com
- mathematics.....math
- maximum.....max
- minimum.....min
- negative.....neg
- positive.....pos
- probability.....prob
- product.....prod
- system.....sys

☐ special rule
to abbreviate a word,
use the first two syllables

examples:

- arithmetic.....arith
- coefficient.....coef
- geometry.....geom
- nonnegative.....nonneg
- nonpositive.....nonpos
- polynomial.....poly

☐ special rule
to abbreviate a word ending with x,
use the first letter,
one or more interior letters,
and the last letter

examples:

- affix.....afx
- afflux.....alx
- annex.....anx
- apex.....apx
- appendix.....apnx
- biconvex.....bcx
- box.....box

- circumflex.....ccx
- complex.....cmx
- conflux.....cfx
- convex.....cnx
- crux.....crx
- directrix.....drx
- efflux.....efx
- fix.....fix
- flux.....flx
- generatrix.....grx
- googolplex.....ggx
- helix.....hlx
- hex.....hex

- index.....inx
- infix.....ifx
- influx.....ilx
- matrix.....mtx
- minimax.....mmx
- mix.....mix
- multiplex.....mlx
- paradox.....pdx
- parallax.....plx
- perplex.....ppx
- postfix.....psx
- prefix.....prx
- quadratrix.....qtx
- quadruplex.....qpx
- quincunx.....qcx

- radix.....rdx
- reflex.....rfex
- reflux.....rlux
- retroflex.....rtx
- separatrix.....spx
- simplex.....smx

(• six.....6)

- subindex.....snx
- suffix.....sfx
- syntax.....snx
- tractrix.....trx
- trisectrix.....tsx
- vertex.....verx
- vortex.....vorx

☐ special rule
to use the abbreviation of a word
as a mathematical symbol (often for a function),
choose the first three letters lower-cased

examples:

- angle.....ang
- degree.....deg
- minute.....min
- second.....sec
- radian.....rad

.

- exponential.....exp
- logarithm.....log

- sine.....sin
- cosine.....cos
- tangent.....tan
- cotangent.....cot
- secant.....sec
- dimension.....dim
- limit.....lim
- interior.....int
- exterior.....ext
- ulterior.....ult
- maximum.....max
- minimum.....min

☐ some abbreviations involving order/placement/size

- rt = right
- lt = left
- RS = right side
- LS = left side
- RHS = right-hand side
- LHS = left-hand side
- max = maximum
- min = minimum
- ext = extremum
- opt = optimum
- est = estimate
- gest = guestimate = guessed estimate

- hi = high
- lo = low
- up = upper
- lw = lower
- dw = down
- up lim = $\overline{\lim}$ = upper limit
- lw limit = $\underline{\lim}$ = lower limit
- usc = upper semicontinuous
- lsc = lower semicontinuous
- sup = superior
- inf = inferior
- lim sup = sup lim = $\overline{\lim}$ = limit superior = superior limit
- lim inf = inf lim = $\underline{\lim}$ = limit inferior = inferior limit

- grt = greatest
- lst = least
- gcd = greatest common divisor
- hcf = highest common factor
- lcd = least/lowest common denominator
- lcm = least/lowest common multiple
- ub = set of upper bounds
- lb = set of lower bounds
- glb = greatest lower bound
- lub = least upper bound
- sup = supremum
- inf = infimum

- PO = partial order(ing)
- TO = total order(ing)
- WO = well-order(ing)
- IWO = inverse well-order(ing)
- poset = partially ordered set
- toset = totally ordered set
- woset = wellordered set
- iwoset = inversely wellordered set
- crd = cardinal (number)
- ord = ordinal (number)
- Crd = the class of all cardinals
- Ord = the class of all ordinals

☐ the eight morphism words

- automorphism
- endomorphism
- epimorphism
- homeomorphism
- homomorphism
- isomorphism
- monomorphism
- morphism

may be abbreviated by the first three letters
except for homeomorphism abbreviated homeo

☐ comment
the eight morphism words
are rooted in the Greek words

- αυτος = same, self
- ενδον = within
- επι = on, upon, etc
- ομοιος = similar to
- ομος = one and the same
- ισος = equal
- μονος = single
- μορφη = form, shape

☐ special cases of abbreviations

- if and only if.....iff
- in particular.....inp
- in general.....ing
- without loss of generality.....wolog
- partially ordered set.....poset
- totally ordered set.....toset
- wellordered set.....woset
- inversely wellordered set.....iwoset
- first quadrant.....QI
- second quadrant.....QII
- third quadrant.....QIII
- fourth quadrant.....QIV

- hyperbolic sine.....sinh
- hyperbolic cosine.....cosh
- hyperbolic tangent.....tanh
- hyperbolic cotangent.....coth
- hyperbolic secant.....sech
- hyperbolic cosecant.....csch
- Système International d'Unités.....SI
- parentheses.....parens

(• parenthesis.....paren)

☐ comment
there are certain clusters
of mathematically useful words
that tend to resist the formation of
short distinguishing easy-to-read abbreviations;
here are two examples:

• comp- words
compact
companion
comparability
comparable
compass
complement
complete
complex
complicate
component
composite
composition
compound
compressibility
compressible
computer
& their variants

• inte- words
integer
integrability
integrable
integral
integrand
integration
intensity
interaction
intercept
interdependence
interdependent
interest
interior
intermediate
internal
interpolation
interpretation
intersection
interval
& their variants