Mathematical Notations

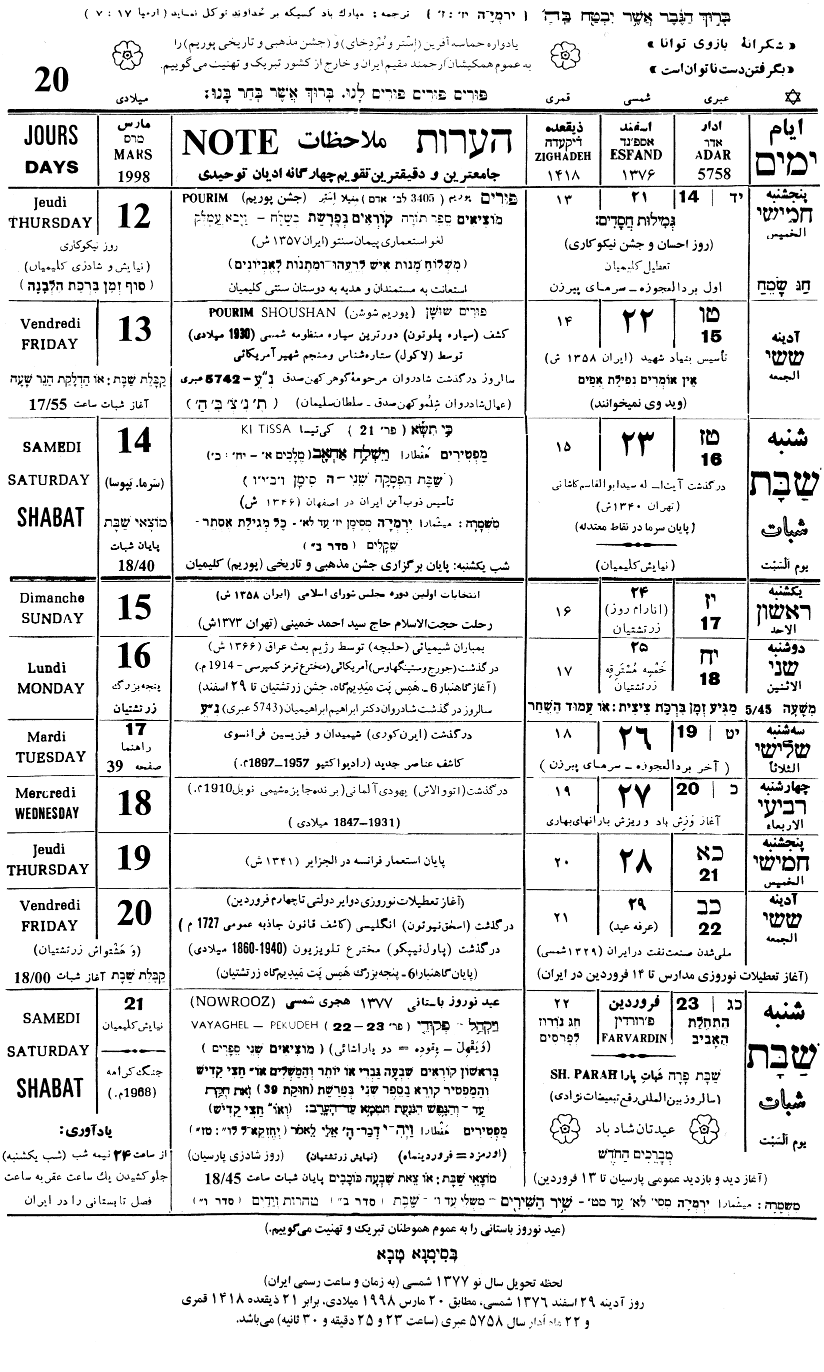
Notation	Name	Meaning
$\lfloor x \rfloor$	floor	largest integer not larger than x
$\lceil x \rceil$	ceiling	smallest integer not smaller than x
round(x)	round	nearest integer to x, that is, $\lfloor x + 0.5 \rfloor$
$x \bmod y$	remainder	$x - y\lfloor x/y \rfloor$
$x \bmod [1 \,..\, y]$	adjusted remainder	y if $x \bmod y = 0$, $x \bmod y$ otherwise
$x \bmod [a \,..\, b)$	interval mod	x if $a = b$, $a + (x - a) \bmod (b - a)$ otherwise
gcd(x, y)	greatest common divisor	x if $y = 0$, gcd(y, $x \bmod y$) otherwise
lcm(x, y)	least common multiple	$xy/\gcd(x, y)$
$\lvert x \rvert$	absolute value	unsigned value of x
sign(x)	sign	-1 when x is negative, $+1$ when x is positive, 0 when x is 0
$i^\circ j' k''$	angle	i degrees, j arc minutes, and k arc seconds
$\varphi(n)$	totient function	number of positive integers less than n and relatively prime to it
π	pi	ratio of circumference of circle to diameter
$\sin x$	sine	sine of x, given in degrees
$\cos x$	cosine	cosine of x, given in degrees
$\tan x$	tangent	tangent of x, given in degrees
$\arcsin x$	arc sine	inverse sine of x, in degrees

continued

Notation	Name	Meaning
$\arccos x$	arc cosine	inverse cosine of x, in degrees
$\arctan x$	arc tangent	inverse tangent of x, in degrees
$[a \,..\, b]$	closed interval	all real numbers x, $a \leqslant x \leqslant b$
$(a \,..\, b)$	open interval	all real numbers x, $a < x < b$
$[a \,..\, b)$	half-open interval	all real numbers x, $a \leqslant x < b$
$(a \,..\, b]$	half-open interval	all real numbers x, $a < x \leqslant b$
$\neg p$	logical negation	true when p is false and vice versa
$\sum_{i \geqslant k}^{p(i)} f(i)$	summation	the sum of $f(i)$ for all integers $i = k, k+1, \ldots$, continuing only as long as the condition $p(i)$ holds
$\prod_{i \geqslant k}^{p(i)} f(i)$	product	the product of $f(i)$ for all integers $i = k, k+1, \ldots$, continuing only as long as the condition $p(i)$ holds
$\sum f(\tilde{x}, \tilde{y}, \ldots)$	summation	the sum of $f(\tilde{x}_i, \tilde{y}_i \ldots)$ for all like-indexed components of the vectors $\tilde{x}$, $\tilde{y}$, ...
$\underset{\xi \geqslant \mu}{\mathbf{MAX}}\{\psi(\xi)\}$	maximum integer value	the largest integer $\xi = \mu, \mu+1, \ldots$ such that $\psi(\mu), \psi(\mu+1), \ldots, \psi(\xi)$ are true
$\underset{\xi \geqslant \mu}{\mathbf{MIN}}\{\psi(\xi)\}$	minimum integer value	the smallest integer $\xi = \mu, \mu+1, \ldots$ such that $\psi(\xi)$ is true
$\underset{\xi \in [\mu..\nu]}{\overset{p(\mu,\nu)}{\mathbf{MIN}}}\{\psi(\xi)\}$	minimum value	the value ξ such that ψ is false in $[\mu \,..\, \xi)$ and is true in $[\xi \,..\, \nu]$; see equation (1.35) on page 24 for details
$f^{-1}(y, [a \,..\, b])$	function inverse	approximate x in $[a \,..\, b]$ such that $f(x) = y$
$\boxed{\mathrm{f}_1 \mid \mathrm{f}_2 \mid \mathrm{f}_3} \cdots$	record formation	the record containing fields $\mathrm{f}_1, \mathrm{f}_2, \mathrm{f}_3, \ldots$
$R_{\mathbf{f}}$	field selection	contents of field **f** of record R
$\langle x_0, x_1, x_2, \ldots \rangle$	list construction	the list containing $x_0, x_1, x_2, \ldots$
$\langle\,\rangle$	empty list	a list with no elements
$L_{[i]}$	list element	the ith element of list L; 0-based
$L_{[i..]}$	sublist	a list of the ith, $(i+1)$st, and so on elements of list L
$A \parallel B$	concatenation	the concatenation of lists A and B

continued

Notation	Name	Meaning
$\tilde{x}$	vector	indexed list of elements $\langle x_0, x_1, \ldots \rangle$
$\{x_0, x_1, x_2, \ldots\}$	set formation	the set containing $x_0, x_1, x_2, \ldots$
$x \in S$	set membership	the element x is a member of set S
$x \in \mathbf{Z}$	integer	the number x is an integer
$A \cap B$	set intersection	the intersection of sets A and B
$A \cup B$	set union	the union of sets A and B
$i \,..\, j$	range of integers	the set $\{i, i+1, \ldots, j\}$
$\langle b_1, \ldots, b_k; b_{k+1}, \ldots, b_n \rangle$	mixed-radix base	each position i takes values in $[0 \,..\, b_i)$, with units in position k
$a \xleftarrow{\text{rad}} b$	mixed-radix number	value of a in base b
$x \xrightarrow{\text{rad}} b$	mixed-radix representation	representation of x in base b
$h : m : s$	time of day	h hours, m minutes, and s seconds
$i^{\text{d}} j^{\text{h}} k^{\text{m}} l^{\text{s}}$	duration of time	i days, j hours, k minutes, and l seconds
bogus	error	invalid calendar date or time



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JOURS DAYS	مارس מרס MARS 1998	הערות ملاحظات NOTE جامعترین و دقیقترین تقویم چهارگانه ادیان توحیدی	ذیقعده דיקעדה ZIGHADEH ۱۴۱۸	اسفند אספנד ESFAND ۱۳۷۶	ادار אדר ADAR 5758	ایام ימים
Jeudi THURSDAY	12	פּוּרִים POURIM (جشن پوریم) מוֹצִיאִים סֵפֶר תּוֹרָה קוֹרְאִים בְּפָרָשַׁת בְּשַׁלַּח – וַיָּבֹא עֲמָלֵק	۱۳	۲۱	יד 14	پنجشنبه חֲמִישִׁי الخميس
Vendredi FRIDAY	13	פּוּרִים שׁוּשָׁן POURIM SHOUSHAN (پوریم شوشن)	۱۴	۲۲	טו 15	آدینه שִׁשִּׁי الجمعه
SAMEDI SATURDAY SHABAT	14	כִּי תִשָּׂא KI TISSA (פר׳ 21)	۱۵	۲۳	טז 16	شنبه שַׁבָּת شبات
Dimanche SUNDAY	15	انتخابات اولین دوره مجلس شورای اسلامی (ایران ۱۳۵۸ ش)	۱۶	۲۴	יז 17	یکشنبه רִאשׁוֹן الاحد
Lundi MONDAY	16		۱۷	۲۵	יח 18	دوشنبه שֵׁנִי الاثنين
Mardi TUESDAY	17		۱۸	۲۶	יט 19	سه‌شنبه שְׁלִישִׁי الثلاثا
Mercredi WEDNESDAY	18	(1847–1931 میلادی)	۱۹	۲۷	כ 20	چهارشنبه רְבִיעִי الاربعاء
Jeudi THURSDAY	19	پایان استعمار فرانسه در الجزایر (۱۳۴۱ ش)	۲۰	۲۸	כא 21	پنجشنبه חֲמִישִׁי الخميس
Vendredi FRIDAY	20		۲۱	۲۹	כב 22	آدینه שִׁשִּׁי الجمعه
SAMEDI SATURDAY SHABAT	21	عید نوروز باستانی ۱۳۷۷ هجری شمسی (NOWROOZ) VAYAGHEL — PEKUDEH (פר׳ 22 – 23) SH. PARAH	۲۲	فروردین FARVARDIN	כג 23	شنبه שַׁבָּת شبات

(عید نوروز باستانی را به عموم هموطنان تبریک و تهنیت می‌گوییم.)

בְּסִימָנָא טָבָא

Page from an Iranian synagogue calendar for mid-March 1998 showing the Gregorian, Hebrew, Persian, and Islamic calendars. (Collection of E.M.R.)