

The Numerals

Cardinals

§ The cardinal numbers are as follows :

1 *ēv/ ē* (OPers. *aiva-*, Av. *aēva-*, *aēvahe*, Parth. *ēv*, Paz. *ē*), *ēk/ yak* < **aḷḷakahja* (Paz. *yak*): *ēv zamān pāy* ‘wait a moment’ M 3; *ēk az hambāyān* ‘one of (his) associates’ Dk viii M 713; *ēv°/ ē°*.

2 *do* (Av. *dve-*, *dvayā*, Paz. *du*): *bunēštag ēk ayāb do?* ‘is there on principle or are there two principles?’ CHP 1; *do°*.

3 *si* or *se*: (Av. *θray-/ θri-*°, Parth. *hri*, Paz. *se*) : *si ātaš* ‘three fires’ VZ 30.31 ; *si°*.

4 *cahār* (Av. *caθβar-/ catur-*, Parth. *cafār*) : *taxt-ē kē-š cahār pāy* ‘a throne which has four legs’ ŠGV 14.64; *cahār°*, *tas°* < **caçu°* (Av. *caθru°* parth. *cuhr°*) : *hān yazd ēv tas-kirb* ‘that deity who has four shapes’ T III 260 b I R I 20-21.

5 *panz* (Av. *paṇca*, Parth. *panj*) : *panz gāh* ‘five watches’ Dk viii M 735; *panz°*.

6 *šaš* (Av. *xšvaš*, Parth. *šoh*) : *šaš gāh ī gāhānbār* ‘the six festivals of the year’ MX 57.13 ; *šaš°*.

7 *haft* (Av. *hapta*): *haft kišvar* ‘seven continents’ SS 5; *haft°*.

8 *ašt/ hašt* (Av. *ašta*, Parth. *hašt*): *aburnāyag ī ... ašt-sālag* ‘an eight year old boy’ RP 17a 1; *ašt°*.

9 *nō/ nōh* (Av. *nava*, Paz. *nuh*): *nōh-šabag ud māh-dranā* ‘for nine nights and a month’s duration’ Vd 5.44; *nō°/ nōh°*.

10 *dah* (Av. *dasa/ G dasā*, Parth. *das*): *dah handarz* ‘ten injunctions’ Dk iii M 215; *dah°*.

11 *yāzdah* (Av. **aēvan-dasa*, Parth. *ēvandas*).

12 *dvāzdah* (Av. *dva.dasa*, Parth. *divādes*).

13 *sezdah* < **θraḷjaz-dasa* (Av. **θri.dasa*, Parth. **hriḍas*).

14 *cahārdah* (Av. **caθru.dasa*, Parth. *cafārḍas*).

15 *pānzdah/ pāzdah* (Av. *paṇca.dasa*, Parth. **panjḍas*, Paz. *panždah*).

16 *šāzdah* (Av. *xšvaš.dasa*, Parth. *šohḍas*, Paz. *šqždah*).

17 *haftdah/ hafdah* (Av. **hapta.dasa*, Paz. *hafḍaha*, Parth. *haftḍas*).

18 *aštdah/ haštdah* (Av. **ašta.dasa*, Paz. *hazdah*, Parth. *haštḍas*).

19 *nōzdah* (Av. **nava.dasa*).

20 *vīst* (Av. *visqsta*).

21 *vīst-u-ēk*; ...

30 *sīh* (Av. *θrisant-*, *θrisatəm*, *θrisatanqm*, Parth. *hrist*).

40 *cahal* (Av. *caθβarəsātəm*, Parth. *cafarast*, Paz. *cihal*).

50 *panzāh* (Av. *paṇcāsātəm*, Parth. *panjāst*, Paz. *panjāh*).

60 *šast* (Av. *xšvašti-*, Parth. *šašt*).

70 *haftād* (Av. *haptāiti-*).

80 *aštād/ haštād* (Av. *aštāiti-*).

90 *navad* (Av. *navaiti-*).

100 *sad* (Av. *sata-*).

- 101 *sad-u-ēk* ; ...
 180 *sad-u-aštād* (Av. *duye ... navaiti*) ; ...
 200 *dvēst/ dvēsad* < **duuaj* & *sataj* (Av. *dvaē-ca saite, duye saite*, Parth. *duvēsad*).
 300 *tirēst/ sisad* (Av. *θri-sata, θrāyō sata, tišrō sata*, Parth. *hrisad*).
 400 *cahārsad* (Av. *caθβārō sata*).
 500 *panz-sad* (Av. *pañca sata*, Paz. *paṣat*).
 600 *šaš-sad* (Av. *xšvaš sata*).
 700 *haft-sad* (Av. *hapta sata*).
 800 *ašt-sad* (Av. *ašta sata*).
 900 *nōh-sad* (Av. *nava sata*).
 1000 *hazār* (Av. *hazaṇra-*).
 1001 *hazār-u-ēk* ; ...
 2000 *do-hazār* (Av. *duye hazaṇre*).
 9000 *nō-hazār* (Av. *nava hazaṇra*) ; ...
 10 000 *bēvar* (Av. *baēvarə*) = *dah-hazār*.
 1000 000 *hazār-hazār*.

§ A cardinal number can take the plural oblique ending *-ⁿān*, and sometimes *-ⁿīn* (/ *-^rīn*).

avēšān āgenīn harv donān dast grift ‘they both held hands’ KSM 36; *abar harv donīn nēk ud ud vad* ‘for both good and evil’ F 2.2 (cf. Khot. *māju dvīnu hvamḍānu* ‘of us two men’); *donīn sinīn cahārīn panzenīn šašnīn haftnīn aštnīn nōhnīn dahnīn* Y11.9; *avēšān donān asrēštārān* ‘those two arch-demons’ T III 260 c R I 10-11; *šalvār dorīn* ‘trousers folded twice’ XXF 20.

θr(a)yaqm: sinīn F 1; *sinān gyāgān* ‘(those) three who shall come’ M 31 I V 1.

cahārān zōrān ‘the four forces’ VZ 30.21; *cahārīn* Y 11.9.

panzān darān ‘the five doors’ M 2 V I 33 (cf. Parth. *panjān rōšnān* ‘the five lights’), *panznīn* Y 11.9.

šašān ... fraškird-kirdārān ‘the five agents of the Renovation’ VZ 35.19; *šašnīn* Y 11.9.

haftān ‘the seven (planets)’ Bd 189; *haftnīn* Y 11.9.

dvāzdahān ‘the twelve (signs of the zodiac)’ KAP 3.4.

§ Compound numerals are expressed in two forms: 1) the larger numbers come first; the conjunctions *u(d)* being optionally inserted, or omitted; 2) the smaller numbers are put before.

sisad-u-šast-u-panz rōz ‘365 days’ Dk iii M 402; *nōh ud navad ud nōhsad ud nōh-hazār ud nōh-bēvar* ‘99 999’ MX 49.15 (Av. *navaca navaitišca navaca sata navaca hazaṇra navasāscā baēvaṇ*); *mar do-hazār dvēsad cahal u cahār* ‘number: 2 244’.

§ The indefiniteness can be expressed by means of the numeral *ēv/ ē* which follows the noun.

rēdak-ē ‘a boy’ HKR 1; *mard-ē* ‘a man’ AVN 36.1.

Ordinals

§ *fradum* ‘first’ (OPers. *fratama-*, Av. *fratəma-*, Parth. *afradum*, Aram. *prtm*) Dk iv M 410; *nax^vist/ noxist* (Parth. *nax^višt*, Paz. *naxust*) RP 23.16; *nax^vēn, ēn nax^vēn andarz ī niyūšāgān* ‘this is the first commandment for hearers’ M 794 ii; *ēk/ °ēk, sīh-u-ēk frašn* ‘the thirsty and first questions’ MJF 3.89.

didīg/ dudīg ‘second; next’ < **duitiija-ka-* (OPers. *pati duvitiyam* ‘for the second’, Av. *bitya-/ G daibitya-*, Parth. *bidīg*), *dudīg rōz* ‘next day’ M 2 R II 37; *didīgar/ dudīgar* < **°kara-*, *didīgar rōz* ‘next day’ X^vR II.14; *d^uvum* ‘second’, *duvum frašn* ‘second question’ MJF 2.17; *didum* DD 31.10; *did, rōz ī did* ‘next day’ KAP 4.19.

sidīg ‘third’ < **θritija-ka-* (OPers. *çitiyam*, Av. *θritya-*, Parth. *hridīg*), *ēk ... dudīg ... sidīg ... tasum ... panzum* T II D 126 I; *sidīgar, fardum ... didīgar ... sidīgar* Dk iv M 410; *s(i)yum* MJF 2.20; *sedum* MSR 22; *sid, fradum ... did ... sid ... cahārum ... abдум* Dk iii M 273-74.

tasum ‘fourth’ < **čaθru-ma-* (Av. *tuirya-*), *sidīgar ... tasum* Dk vii M 624; *cahārum* (Parth. *cuhrum*), *cahārum bār* ‘the fourth time’ ZVY 9.22.

§ The other ordinals, except the compounds ‘...-first’, are formed by adding the ending *-um* (< **-ama-*) to the cardinal numbers.

panzum ‘fifth’ (Skt. *pañcamá-*, Av. *puxda-*, Parth. *panjum*).

šašum/ šohum ‘sixth’ (Av. *xštva-*).

haftum ‘seventh’ (Khot. *haudama-*, Av. *haptaθa-*).

aštum ‘eighth’ (Av. *aštəma-*).

nōhum/ nahum ‘ninth’ (Av. *naoma-*, Parth. *nahum*).

dahum ‘tenth’ (Av. *dasəma-*).

yāzdaum ‘eleventh’ (Av. *aēvandasa-*).

dvāzdahum ‘twelfth’ (Av. *dvadasa-*).

sezdahum ‘thirteenth’ (Av. *θridasa-*, Parth. *hriḍasamīg*).

cahārdahum ‘fourteenth’ (Av. *caθrudasa-*).

pānzdahum ‘fifteenth’ (Av. *pañcadasa-*).

šāzdahum ‘sixteenth’ (Av. *xšvaš.dasa-*).

haftdaum ‘seventeenth’ (Av. *hapta.dasa-*).

aštahum ‘eighteenth’ (Av. *ašta.dasa-*).

nōzdahum ‘nineteenth’ (Av. *nava.dasa-*).

vīstum ‘twentieth’ (Av. *visastəma-*).

vīst-u-ēk ‘21st’.

vīst-u-duvum ‘22nd’ ...

sīhum ‘23rd’ (Av. *θrisatəma-*).

sīh-u-ēk ‘31st’.

sīh-u-duvum ‘32nd’.

sīh-u-siyum ‘33rd’ ...

Distributives

§ Distributives are formed by repetition of the cardinal numbers.

ēk ēk (Skt. *ēka-ekaḥ*), *ēk ēk judāg nām* ‘one by one, (their) name is differed’ Dk iv M 410; *ēv ēvrāstvān* (M 33 I R i-R ii Parth. *ēv ēv rāštvasan*).

do do ‘two by two’ VZ 3.52 (Parth. M 67 R ii 12 *do do dy’syb*).

si si ‘three each, three by three, by threes’, *se se andar ēv pāygōs* ‘three each in one region’ M 99 I V 18-19 (Boyce y 5).

Multiplicatives

§ Multiplicatives are formed from the cardinals by means of the ending *-gānag (-ānag)*: *ēvgānag/ ēkānag; do(g)ānag; si(g)ānag; ...*

abar vindišn ī farr ī ēvgānag nišyān, ud doānag ravšān-z, ud siānag tazān, ud cahārānag divan-z, ud panzganag barān-z ped asp, ud šašānag vāzān-z ped rah, ud haftgānag ped dādestān-šnāxtārīh ud vizārdārīh, aštgānag ped hubānagīh ī xāstagān-z, ud nōhgānag ped šnāsagīhā +toxšāgīh ī abar varzīdārīh ī zamīg, ud dahānag ped hamōzgarīh ī mārspend ‘about the finding of Fortune, singly sitting, two-fold walking, threefold rushing, fourfold running (on foot), five-fold riding a horse, six-fold driving a chariot, seven-fold in understang and interpreting the law, eight-fold by good protection of possessions, nine-fold with expert industry in the cultivation of land, and ten-fold by teaching the sacred formulas’ Dk ix M 791; *ēk sadgānag ud ēk hazārgānag ud bēvargānag bavend druz ...* ‘a hundred, a thousand, a myriad-fold will become the demons ...’ ZVY 6.5.

§ The adverbial multiplicatives are expressed by means of the cardinals followed by *bār* ‘time’ (< **uāra-*), *jār* (< **jāuar*)/ Parth. *yāvar* (Paz. *jāvar*).

ē(v) bār, ēk bār ‘once’ (Skt. *eka-vāram*); *do-bār; ...: ēk-bār ... do-bār ... si-bār* rendering Av. *hakarəṭ ... biš ... θriš ...* Vd 7.74-75.

si-jār ‘three times’ Bd 236.

Fractions

§ A fraction may be expressed by noun.

nēm/ nēmāg ‘a half’ (Av. *naēma-*); *srišoyag* ‘a third’ (Av. *θrišva-*); *casrušoyag* ‘a fourth’ (Av. *caθrušva-, caθrušvaða-*); *panzoyag* ‘a fifth’ (Av. *pañtaṇha-*); *šašoyag* ‘a sixth’ (Av. **xšvašāṇha-*); *haftoyag* ‘a seventh’ (Av. *haptaṇha-*); *aštoyag* ‘an eighth’ (Av. *aštaṇha-*); *nahoyag* (Av. *navāṇha-*); *dahoyag* ‘a tenth’ (Av. **dasāṇha-*); ... *vīstoyag* (cf. Arab. *بيستويه*); ...

si kišvar ud nēm ‘there and a half continents’ Bd 55; *do ud nēm* Petit II 3.1; *do srišoyag* ‘two thirds’ Dk iii M 195; *casrušoyag ī gāhān andar sāl-ē* ‘a fourth of the Gāṅhā in a year’ N 42.

§ A fraction may be expressed by means of two cardinals in apposition, the denominator preceding the numerator –sometimes, before the numerals *ped* is added.

si ēk ‘one-third’, *si-ēk ī rōz* ‘one-third of the day’ CHP 8; *abārīg dām ... ped si ēk-ē abāz ōbāred* ‘he will devore one third of the other creatures’ ZVY 9.16; *ēn mardōm ped dah nō* ‘nine-tenth of these men’ ZVY 4.55.

§ A fraction may be mixed with a multiplicative: *nēm dah ēk* ‘one-twentieth’; *do si ēk* ‘two-third’. ...

nazdist ō si ēk ī ēn zamīg, ud didīgar ō do si ēk ī ēn zamīg, ud sidīgar ō ēn zamīg hamāg bē mad ‘first he came to one-third of this earth, secondly to two-thirds of this earth, and thirdly to the whole of this earth’ Bd 71-2; *x^varšēd ped karzang do si ēk ī pāy ī mard* ‘(when) the sun is in Cancer, (the shadow) is two-third of a man’s food’ ŠnŠ 21.2.

§ Sometimes the word *bahr* ‘part, share’ (< **baxθra-*) is added to both members of a function.

(*ped*) *do bahr ē(v) bahr* ‘half, moiety’: *ped do bahr ē bahr abaxš ō vahmān ī vahmān dād ham* ‘I give half (of it), without deduction, to N, daughter of N’ PZ 7.

(*ped*) *si bahr ē(v) bahr* ‘one-third’: *ped si bahr ēv bahr ō mihrēn ud abārīg ō farrox dahend* ‘one third (of a thing) is conveyed to Mihrēn and the rest to Farrox’ MHD A 33.15-16.

Other numeral expressions

§ A cardinal may be followed by *tāg* ‘piece, unit’ (< **tāya-ka-*).
ēv tāg ‘single’; *do-tāg* ‘two pieces; two-fold’; ...
šāzdah tāg az uzumburd ‘sixteen pieces of emerald’ VC 1.

§ *bišāmrud(īg)*, *srišāmrud(īg)*, *casrušāmrud(īg)* directly come from Avesta (Av. *biš-āmruta-* ‘spoken twice’, *θriš-āmruta-* ‘spoken thrice’, *caθruš-āmruta-* ‘spoken four times’).

§ A cardinal may be followed by *hāvand*, or *ēvēnag*.
dah hāvand hān ī ... ‘ten times as much as that ...’ Dk ix M 819.
dā kirbag do ēvēnag baved ... ‘until good deeds may become double ...’ HDV 17.

Operations

§ The Addition

$x + y = z$: *x ud y (ast) z* ; *abzōn ī x abar y (ast) z*.
do ud si panz ‘2 + 3 = 5’
abzōn ī ēk abar do si ‘1 + 2 = 3’ Dk iv M 410.

§ The Substraction

$x - y = z$: *y az x (ast) z* ; *kast ī y az x (ast) z*.
do az si ēk ‘3 - 2 = 1’

§ The Multiplicative

$x \times y = z$: *x bār y (ast) z*.

ēk bār ēk ēk, do bār do cahār '1 × 1 = 1, 2 × 2 = 4' ŠGV 5.12;
cahār bār haft <*vīst-u-ašt*> '4 × 7 = 28' Bd 194.

سه بار دو بار یا دو بار سه بار شش بار بود. (بیرونی، التفهیم، ۲۴)

§ The division

x/y : (*ped*) *y x* ; (*ped*) *y bahr x bahr*.

ped dah nō '9 / 10' ZVY 4.55 ; *si bahr ēv bahr* '1 / 3' MHD 53 ;

ped si bahr ēv bahr '1 / 3' MHD 103.

bahrag ašt ōh kunišn 'a division into 8 shares must be made' MHD
65.