

Naravna števila

1.1. Deljivost števil s 4, z 8 in 10^n

1 a), c), d), g), h), i), j), k)

2 c), d), f), h), i), j), k)

3 z 10: a), b), c), č), d), f), g), h), j), k)

s 100: a), c), d), g), h), k)

4

a) 40, 44, 48; 12, 32, 52, 72, 92; 120, 124, 128; 204, 224, 244, 264, 284; 4400, 4404, 4408, 4412, 4416, 4420, 4424, 4428, 4432, 4436, 4440, 4444, 4448, 4452, 4456, 4460, 4464, 4468, 4472, 4476, 4480, 4484, 4488, 4492, 4496; 5072, 5172, 5272, 5372, 5472, 5572, 5672, 5772, 5872, 5972

b) 72; 48, 88;

c) 30; 430; 100, 110, 120, 130, 140, 150, 160, 170, 180, 190; 3400, 3410, 3420, 3430, 3440, 3450, 3460, 3470, 3480, 3490; 3370; 510

č) 300; 4300; 5200; 7000, 7100, 7200, 7300, 7400, 7500, 7600, 7700, 7800, 7900; 9000, 9100, 9200, 9300, 9400, 9500, 9600, 9700, 9800, 9900

d) 4000; 5000; 62000; 80000, 81000, 82000, 83000, 84000, 85000, 86000, 87000, 88000, 89000

5 48, 88, 488, 848, 888

6 100, 400, 700, 4200

7 3000, 4000, 5000, 6000, 7000, 8000, 9000, 10000

Vsa števila so obkrožena z vsemi tremi barvami. Vsa števila, deljiva s 1000, so hkrati deljiva tudi z 8 in s 4.

8 Ne, saj število 342 ni deljivo s 4.

9

a) Vhod A: 724 EUR

Vhod B: 488 EUR

Vhod C: 440 EUR

b) Vhod A: 181 obiskovalcev

Vhod B: 61 obiskovalcev

Vhod C: 44 obiskovalcev

Konjeniški turnir je obiskalo 286 obiskovalcev.

1.2. Praštevila

1

$$D_{15} = \{1, 3, 5, 15\}$$

$$D_{16} = \{1, 2, 4, 8, 16\}$$

$$D_{17} = \{1, 17\}$$

$$D_{18} = \{1, 2, 3, 6, 9, 18\}$$

$$D_{19} = \{1, 19\}$$

$$D_{20} = \{1, 2, 4, 5, 10, 20\}$$

$$D_{21} = \{1, 3, 7, 21\}$$

$$D_{22} = \{1, 2, 11, 22\}$$

$$D_{23} = \{1, 23\}$$

$$D_{24} = \{1, 2, 3, 4, 6, 8, 12, 24\}$$

$$D_{25} = \{1, 5, 25\}$$

Praštevila so števila 17, 19 in 23, ker imajo natanko dva delitelja.

2

a) Število 17 je praštevilo, ker ima natanko dva delitelja.

b) Število 24 ni praštevilo, ampak sestavljeno število, saj ima več kot dva delitelja.

3

a) $D_{28} = \{1, 2, 4, 7, 14, 28\}$

- b) $D_{19} = \{1, 19\}$
- c) $D_{35} = \{1, 5, 7, 35\}$
- č) $D_{37} = \{1, 37\}$
- d) $D_{43} = \{1, 43\}$
- e) $D_{111} = \{1, 3, 37, 111\}$
- f) $D_{99} = \{1, 3, 9, 11, 33, 99\}$
- g) $D_{39} = \{1, 3, 13, 39\}$
- h) $D_{81} = \{1, 3, 9, 27, 81\}$
- i) $D_{201} = \{1, 3, 67, 201\}$
- j) $D_{169} = \{1, 13, 169\}$
- k) $D_{196} = \{1, 2, 4, 7, 14, 28, 49, 98, 196\}$

4 c), d), g), i)

5

- a) 1, 3, 5, 7, 9, 11, 13, 15, 17, ... Niz lihih števil.
- b) 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 ... Niz praštevil.

6

- a) $4 = 2 \cdot 2$
- b) $15 = 3 \cdot 5$
- c) $35 = 5 \cdot 7$
- č) $65 = 5 \cdot 13$
- d) $66 = 2 \cdot 3 \cdot 11$
- e) $77 = 7 \cdot 11$
- f) $12 = 2 \cdot 2 \cdot 3$
- g) $385 = 5 \cdot 7 \cdot 11$

7

- a) $30 = 2 \cdot 3 \cdot 5$
- b) $45 = 3 \cdot 3 \cdot 5$
- c) $70 = 2 \cdot 5 \cdot 7$
- č) $42 = 2 \cdot 3 \cdot 7$
- d) $84 = 2 \cdot 2 \cdot 3 \cdot 7$
- e) $126 = 2 \cdot 3 \cdot 3 \cdot 7$
- f) $210 = 2 \cdot 3 \cdot 5 \cdot 7$
- g) $150 = 2 \cdot 3 \cdot 5 \cdot 5$
- h) $77 = 7 \cdot 11$
- i) $55 = 5 \cdot 11$
- j) $65 = 5 \cdot 13$
- k) $84 = 11 \cdot 13$

8

- a) $18 = 2 \cdot 3 \cdot 3$
- b) $28 = 2 \cdot 2 \cdot 7$
- c) $75 = 3 \cdot 5 \cdot 5$
- č) $98 = 2 \cdot 7 \cdot 7$
- d) $154 = 2 \cdot 7 \cdot 11$
- e) $33 = 3 \cdot 11$
- f) $63 = 3 \cdot 3 \cdot 7$

9

- a) Vsa soda števila, razen števila 2, so sestavljena števila. Npr.: 4, 6, 8, 10, ...
- b) Ne drži. Taki praštevili sta 2 in 5. Če se dve števili razlikujeta za 3, je eno število liho, drugo pa sodo. Edini tak par sta praštevili 2 in 5.
- c) To sta praštevili 2 in 3.

10 Najmanjše trimestno praštevilo je 101, največje trimestno praštevilo je 997.

11 $3+5+23=31$, $3+5+29=37$, $3+5+53=61$, $3+7+13=23$, $3+11+29=43$, ...

12 $2+3=5$, $2+5=7$, $2+11=13$, $2+17=19$, $2+29=31$, $2+41=43$, ...

13

- a) To sta števili 2 in 3.
- b) Od dveh zaporednih naravnih števil, je eno sodo in eno liho. Edino sodo praštevilo je število 2, zato je to edini par takih števil.

14

- a) $16 = 3 + 13, 16 = 5 + 11$
- b) $32 = 3 + 29, 32 = 13 + 19$
- c) $20 = 3 + 17, 20 = 7 + 13$
- č) $36 = 5 + 31, 36 = 7 + 29, 36 = 13 + 23, 36 = 17 + 19$
- d) $52 = 5 + 47, 52 = 11 + 41, 52 = 23 + 29$
- e) $38 = 2 \cdot 19$
- f) $42 = 2 \cdot 3 \cdot 7$
- g) $44 = 2 \cdot 2 \cdot 11$
- h) $46 = 2 \cdot 23$
- i) $56 = 2 \cdot 2 \cdot 2 \cdot 7$

15

- a) 3 in 5, 5 in 7, 11 in 13, 17 in 19, 29 in 31, 41 in 43, 59 in 61, ...
- b) 101 in 103, 107 in 109, 137 in 139, 149 in 151, 179 in 181, 191 in 193, ...

16

- a) 11, 13
- b) 13, 17, 19, 23
- c) 29, 31, 37, 41, 43, 47
- č) 19, 23, 29, 31
- d) 59, 61, 67, 71, 73, 79, 83, 89, 97, 101, 103, 107
- e) 113, 127, 131, 139, 149, 151, 157, 163, 167, 173, 179, 181, 191, 197, 199, 211

- 17 Možna večmestna praštevila so tista večmestna liha števila, ki niso deljiva s številom 5. Zadnja števka večmestnega števila je lahko 1, 3, 7 ali 9. Npr.: 11, 13, 17, 19, 23, 29, 31, 37, ...

1.3. Največji skupni delitelj

1

- a) $D_{10} = \{1, 2, 5, 10\}$
- b) $D_{12} = \{1, 2, 3, 4, 6, 12\}$
- c) $D_{15} = \{1, 3, 5, 15\}$
- č) $D_{24} = \{1, 2, 3, 4, 6, 8, 12, 24\}$
- d) $D_8 = \{1, 2, 4, 8\}$
- e) $D_{36} = \{1, 2, 3, 4, 6, 9, 12, 18, 36\}$
- f) $D_{26} = \{1, 2, 13, 26\}$
- g) $D_{100} = \{1, 2, 4, 5, 10, 20, 25, 50, 100\}$
- h) $D_{42} = \{1, 2, 3, 6, 7, 14, 21, 42\}$
- i) $D_{99} = \{1, 3, 9, 11, 33, 99\}$

2

- a) $D_{84} = \{1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84\}$
- b) $D_{126} = \{1, 2, 3, 6, 7, 9, 14, 18, 21, 42, 63, 126\}$
- c) $D_{110} = \{1, 2, 5, 10, 11, 22, 55, 110\}$
- č) $D_{164} = \{1, 2, 4, 41, 82, 164\}$
- d) $D_{218} = \{1, 2, 109, 218\}$
- e) $D_{195} = \{1, 3, 5, 13, 15, 39, 65, 195\}$
- f) $D_{53} = \{1, 53\}$
- g) $D_{72} = \{1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72\}$
- h) $D_{96} = \{1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96\}$
- i) $D_{300} = \{1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 25, 30, 50, 60, 75, 100, 150, 300\}$

3

- a) $D_8 = \{1,2,4,8\}$, $D_{16} = \{1,2,4,8,16\}$; $D_8 \subset D_{16}$
 b) $D_{36} = \{1,2,3,4,6,9,12,18,36\}$, $D_{18} = \{1,2,3,6,9,18\}$; $D_{18} \subset D_{36}$
 c) $D_7 = \{1,7\}$, $D_{14} = \{1,2,7,14\}$; $D_7 \subset D_{14}$
 č) $D_{49} = \{1,7,49\}$, $D_{98} = \{1,2,7,14,49,98\}$; $D_{49} \subset D_{98}$

4

- a) $D_{30} = \{1,2,3,5,6,10,15,30\}$
 b) $D_{35} = \{1,5,7,35\}$
 c) $D_{112} = \{1,2,4,7,8,14,16,28,56,112\}$

5

- a) Vsa praštevila. Npr.: 2, 3.
 b) Vsa števila, ki jih lahko zapišemo kot produkt dveh praštevil. Npr.: 6, 15.
 c) Takih števil ni.

6

- a) $D_{12} = \{1,2,3,4,6,12\}$; $1 + 2 + 3 + 4 + 6 \neq 12$
 b) To je število 28.
 c) $D_{496} = \{1,2,4,8,16,31,62,124,248,496\}$;
 $1 + 2 + 4 + 8 + 16 + 31 + 62 + 124 + 248 = 496$
 $D_{8128} = \{1,2,4,8,16,32,64,127,254,508,1016,2032,4064,8128\}$;
 $1 + 2 + 4 + 8 + 16 + 32 + 64 + 127 + 254 + 508 + 1016 + 2032 + 4064$
 $= 8128$
 č) 33550336, 8589869056, 137438691328, 2305843008139952128

7

- a) 1,2,3,6; $D(18,24)=6$
 b) 1,2; $D(12,26)=2$
 c) 1,3; $D(15,33)=3$
 č) 1,2,4,8; $D(24,56)=8$
 d) 1,2,3,4,6,12; $D(36,48)=12$
 e) 1,7; $D(21,49)=7$

8

- a) $D(4,5)=1$
 b) $D(6,8)=2$
 c) $D(10,15)=5$
 č) $D(16,22)=2$
 d) $D(24,36)=12$
 e) $D(28,42)=14$
 f) $D(20,90)=10$
 g) $D(35,63)=7$
 h) $D(105,150)=15$
 i) $D(140,315)=35$
 j) $D(225,375)=75$
 k) $D(169,390)=13$

9

- a) $D(112,144)=16$
 b) $D(164,188)=4$
 c) $D(210,42)=42$
 č) $D(276,48)=12$

10

- a) 4
 b) 12
 c) 2

- č) 1
- d) 27
- e) 30
- f) 25
- g) 1
- h) 1
- i) 1

11

- a) Da
- b) Ne
- c) Ne
- č) Ne
- d) Da
- e) Da
- f) Da
- g) Ne
- h) Da

12

- a) 4
- b) 12
- c) 17
- č) 8

13

- a) 9
- b) 54
- c) 3
- č) 6
- d) 25
- e) 1

14

- a) 6 in 12, 12 in 18, 30 in 42, ...
- b) 5 in 10, 10 in 15, 35 in 55, ...
7 in 14, 21 in 35, 49 in 77, ...
9 in 18, 27 in 45, 81 in 117, ...
15 in 30, 45 in 60, 45 in 105, ...

15

- a) Drži. Sodi števili sta zagotovo deljivi s številom 2, torej si nista tuji.
- b) Ne drži. Primer: $D(9,27) = 9 \neq 1$.

16 Število učencev v posamezni skupini : 2,3,4,6,8,12,24.

17 $1 \times 32, 2 \times 16, 4 \times 8, 8 \times 4, 16 \times 2, 32 \times 1$

18 $D(324,468)=36$; Največja dolžina ene plošče je 36 cm.

19 Skupna delitelj št. 24, 32 in 54 sta 1 in 2.

Rob kocke lahko meri 1 dm ali 2 dm.

1.4. Najmanjši skupni večkratnik

1

- a) $V_3 = \{3,6,9,12,15,18,21,24,27,30, \dots\}$, $V_6 = \{6,12,18,24,30,36,42,48,54,60, \dots\}$
 $V_3 \subset V_6$
- b) $V_7 = \{7,14,21,28,35,42,56,63,70, \dots\}$,
 $V_{21} = \{21,42,63,84,105,126,147,168,189,210, \dots\}$
 $V_7 \subset V_{21}$
- c) $V_9 = \{9,18,27,36,45,54,63,72,81,90, \dots\}$,

$$V_{18} = \{18, 36, 54, 72, 90, 126, 144, 162, 180, \dots\}$$

$$V_9 \subset V_{18}$$

2

- a) $V_4 = \{4, 8, 12, 16, 20, 24, \dots\}$
- b) $V_8 = \{8, 16, 24, 32, 40, \dots\}$
- c) $V_7 = \{7, 14, 21, 28, 35, \dots\}$
- č) $V_{12} = \{12, 24, 36, 48, 60, \dots\}$
- d) $V_{15} = \{15, 30, 45, 60, 75, 90, \dots\}$
- e) $V_{10} = \{10, 20, 30, 40, 50, 60, \dots\}$
- f) $V_9 = \{9, 18, 27, 36, 45, 54, \dots\}$
- g) $V_3 = \{3, 6, 9, 12, 15, 18, 21, \dots\}$

3

- a) $V_9 = \{9, 18, 27, 36, 45, 54, 63, 72, 81, 90, \dots\}$,
 $V_6 = \{6, 12, 18, 24, 30, 36, 42, 48, 54, 60, \dots\}$
 $v(9, 6) = 18$
- b) $V_5 = \{5, 10, 15, 20, 25, 30, 35, 40, 45, 50, \dots\}$,
 $V_{15} = \{15, 30, 45, 60, 75, 90, 105, 120, 135, 150, \dots\}$
 $v(5, 15) = 15$
- c) $V_2 = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20, \dots\}$,
 $V_8 = \{8, 16, 24, 32, 40, 48, 56, 64, 72, 80, \dots\}$
 $v(2, 8) = 8$
- č) $V_4 = \{4, 8, 12, 16, 20, 24, 28, 32, 36, 40, \dots\}$,
 $V_{12} = \{12, 24, 36, 48, 60, 72, 84, 96, 108, 120, \dots\}$
 $v(4, 12) = 12$
- d) $V_{14} = \{14, 28, 42, 56, 70, 84, 98, 112, 126, 140, \dots\}$,
 $V_{28} = \{28, 56, 84, 112, 140, 168, 196, 224, 252, 280, \dots\}$
 $v(14, 28) = 28$
- e) $V_{17} = \{17, 34, 51, 68, 85, 102, 119, 136, 153, 170, \dots\}$,
 $V_{51} = \{51, 102, 153, 204, 255, 306, 357, 408, 459, 510, \dots\}$
 $v(17, 51) = 51$

4

- a) 15
- b) 30
- c) 24
- č) 56
- d) 90
- e) 75
- f) 527
- g) 1968
- h) 45
- i) 77
- j) 30
- k) 42

5

- a) 2 in 5
- b) 4 in 5
- c) 3 in 5
- č) 10 in 25
- d) 3 in 25
- e) 5 in 16
- f) 4 in 50
- g) 8 in 25

h) 8 in 125

6

- a) 4,12,36
- b) 5,10,15,20,60
- c) 31,62,124

7

- a) 120
- b) 72
- c) 120
- č) 12
- d) 24
- e) 19019

8 $v(30,42)=210$, $210:42=5$. Zobnika dosežeta Izhodiščni položaj po petih vrtljajih pedalov.

9 $v(3,5)=15$. Policija naj načrtuje zasedo vsak petnajsti dan od 30. novembra dalje. To je 15. decembra, 30. decembra, 14. januarja, ...

Utrdi svoje znanje

1

- a) $D_{18} = \{1,2,3,6,9,18\}$
- b) $D_{20} = \{1,2,4,5,10,20\}$
- c) $D_{35} = \{1,5,7,35\}$
- č) $D_{48} = \{1,2,3,4,6,8,12,16,24,48\}$
- d) $D_{50} = \{1,2,5,10,25,50\}$
- e) $D_{75} = \{1,3,5,15,25,75\}$
- f) $D_{33} = \{1,3,11,33\}$
- g) $D_{64} = \{1,2,4,8,16,32,64\}$
- h) $D_{100} = \{1,2,4,5,10,20,25,50,100\}$
- i) $D_{98} = \{1,2,7,14,49,98\}$
- j) $D_{111} = \{1,3,37,111\}$
- k) $D_{101} = \{1,101\}$

2

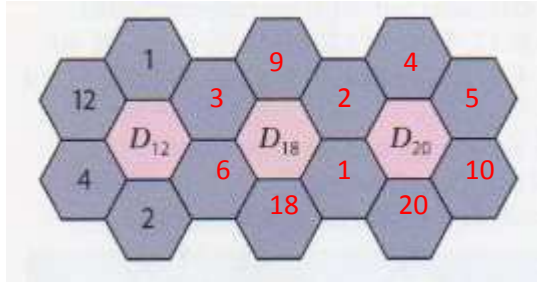
- a) $V_2 = \{2,4,6,8,10, \dots\}$
- b) $V_5 = \{5,10,15,20,25, \dots\}$
- č) $V_8 = \{8,16,24,32,40, \dots\}$
- c) $V_{32} = \{32,64,96,128,160, \dots\}$
- d) $V_{39} = \{39,78,117,156,195, \dots\}$

3

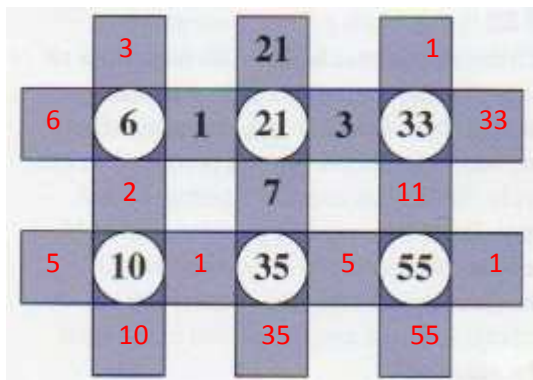
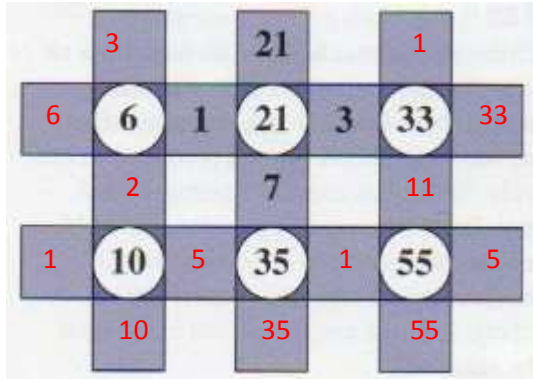
	450	488	580	1200	20400	48000
4		✓	✓	✓	✓	✓
8		✓		✓	✓	✓
10	✓		✓	✓	✓	✓
100				✓	✓	✓
1000						✓

4

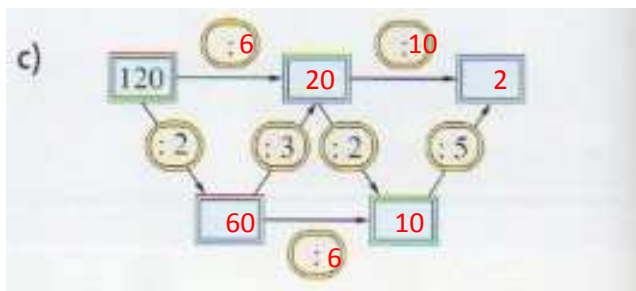
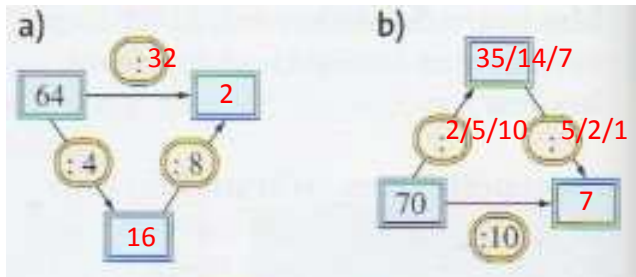
a)



5



6



7

a) 1

b) Ne. Poljubni dve števili imata neskončno skupnih večkratnikov.

8 Skupni delitelji števil 280, 490 in 910 so 1, 2, 5, 7, 10, 14, 35 in 70. Če štejemo, da je lahko na ladji tudi le kapitan, so možna števila razbojnikov 1, 2, 5, 7, 10, 14, 35 ali 70.

9 $v(5,10,6)=30$

Prvič speljejo hkrati ob 6.30 ter nato vsakih 30 minut, to je ob 7.00, 7.30 in 8.00.

10

a) Možni premeri krogov so skupni delitelji števil 168 in 98: 1 cm, 2 cm, 7 cm in 14 cm.

b) $D(168,98)=14$

Največji možni premer je 14 cm.

11

	(2,3)	(7,14)	(13,19)	(24,56)	(1,24)
D	1	7	1	8	1
v	6	14	247	168	24

12

	(a,b)			
	(6,8)	(12,18)	(16,4)	(11,17)
D(a,b)	2	6	4	1
v(a,b)	24	36	16	187
D(a,b).v(a,b)	42	216	64	187
a.b	42	216	64	187

Velja: $D(a,b).v(a,b)=a.b$.

13 Skrivna številka je 832.

$v(3,5)=15$	$15 \cdot 3 = 45$
	$45 + 4 = 49$
	$49 : 7 = 7$
	$7 \cdot 2 \cdot 2 \cdot 5 \cdot 5 = 700$
	$700 - 27 = 673$
	$673 + 2 = 675$
$v(6,15)=30$	$675 + 30 = 705$
$D(138)=138$	$705 + 138 = 843$
	$843 - 11 = 832$