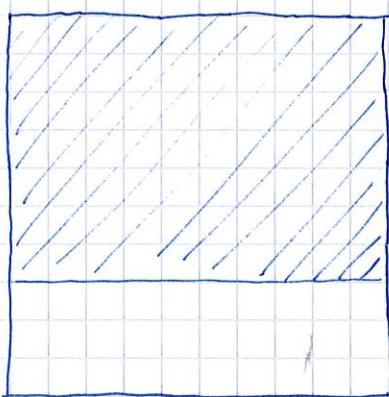


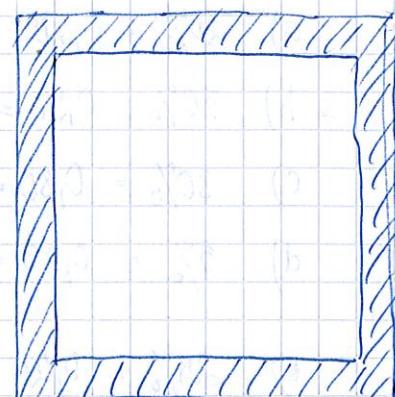
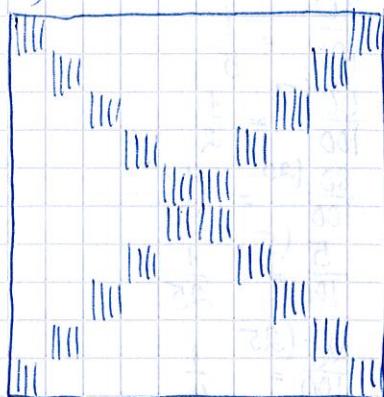
(Harpittele)
S.9

1 Murtto-, desimaali- ja prosenttilukut

1



b)



Kuviosta on väritetty

$$7 \cdot 10 = 70 \text{ ruutua}$$

Kuviossa on

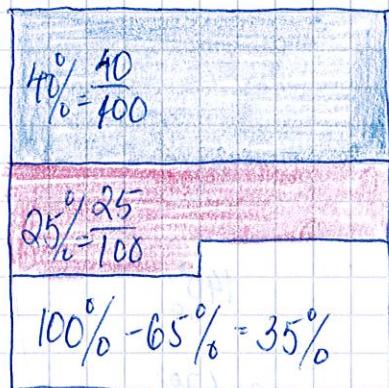
$$10 \cdot 10 = 100 \text{ ruutua}$$

Väritettyjen osuus on

$$\frac{70}{100} = 70\%$$

Koska $\frac{1}{100} = 1\%$

2



$$\text{pun. } 25\% = \frac{25}{100}$$

$$\text{sin } 40\% = \frac{40}{100}$$

25 ruutua

40 ruutua

$$\text{Väittämättä } 100\% - 40\% - 25\% = 35\%$$

3

$$\text{a) } 0,98 = \frac{98}{100} = 98\%$$

$$\text{b) } 0,3 = \frac{30}{100} = 30\%$$

$$\text{c) } 0,02 = \frac{2}{100} = 2\%$$

$$\text{d) } 1,23 = \frac{123}{100} = 123\%$$

$$\text{e) } 2 = \frac{200}{100} = 200\%$$

$$\text{f) } 3,50 = 350\%$$

Huom! Luvut joissa ovat > 1
ovat $> 100\%$!!

4

$$\text{a) } 15\% = 0,15$$

$$\text{b) } 40\% = 0,40$$

$$\text{c) } 7\% = \frac{7}{100} = 0,07$$

$$\text{d) } 116\% = 1,16$$

$$\text{e) } 17,2\% = 0,172$$

$$\text{f) } 0,6\% = 0,006$$

↑ ↑
täydet prosentti-
prosentti- kymm-
osat osat

Harjoittele
5.9

1 Murto-, desimaali- ja prosenttiluku

- 5
- $20\% = 0,20 = \frac{20}{100} = \frac{1}{5}$
 - $50\% = 0,50 = \frac{50}{100} = \frac{1}{2}$
 - $80\% = 0,80 = \frac{80}{100} = \frac{4}{5}$
 - $5\% = 0,05 = \frac{5}{100} = \frac{1}{20}$
 - $25\% = 0,25 = \frac{25}{100} = \frac{1}{4}$
 - $130\% = 1,30 = \frac{130}{100} = \frac{13}{10}$

6 Murtoluku

$$\frac{3}{4}$$

$$\frac{28}{100} = \frac{7}{25}$$

$$\frac{6}{100} = \frac{3}{50}$$

$$\frac{4}{100} = \frac{1}{25}$$

$$\frac{140}{100} = \frac{14}{10} = \frac{7}{5}$$

$$\frac{2}{3}$$

Desimaaliluku

$$0,75$$

$$0,28$$

$$0,06$$

$$0,04$$

$$1,40$$

$$\approx 0,67$$

Prosenttiluku

$$75\%$$

$$28\%$$

$$6\%$$

$$4\%$$

$$140\%$$

$$\approx 67\%$$

7 a) $\frac{9}{10} = \frac{90}{100} = 90\%$

b) $\frac{9}{25} = \frac{36}{100} = 36\%$

c) $\frac{41}{50} = \frac{82}{100} = 82\%$

d) $\frac{3}{12} = \frac{25}{100} = \frac{1}{4} = 25\%$

e) $\frac{20}{4} = \frac{80}{100} = 80\%$

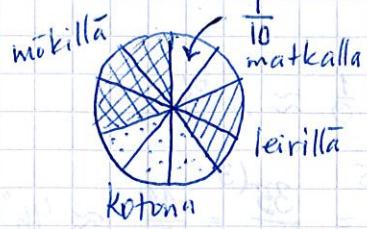
f) $\frac{13}{20} = \frac{65}{100} = 65\%$

Ulkona osattava

- puolikkaat $\frac{1}{2}, \frac{2}{2}, \frac{3}{2}, \dots$
- kolmasosat $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \dots$
- neljäsosat $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \dots$
- viidesosat $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \dots$
- kymmenesosat $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \dots$
- sadasosat $\frac{1}{100}, \frac{2}{100}, \frac{3}{100}, \dots$

(Sovella)
S.9

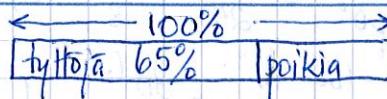
8



1 Murto-, desimaali- ja prosenttiluku

$$\begin{aligned} \text{a) mökillä } \frac{3}{10} &= \frac{30}{100} = 30\% \\ \text{b) leirillä } \frac{2}{10} &= \frac{20}{100} = 20\% \\ \text{c) muualla} &= \text{matkalla} + \text{kotona} \\ &= \frac{2}{10} + \frac{3}{10} = \frac{5}{10} = 50\% \end{aligned}$$

9

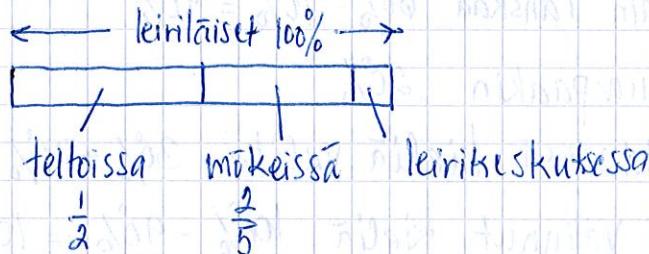


$$\text{a) poikia on } 100\% - 65\% = 35\%$$

$$\text{b) suurempi} = \text{tytöjen osuus} - \text{poikien osuus} = 65\% - 35\% = 30\%$$

V: 30 prosenttiyksikköä suurempi

10

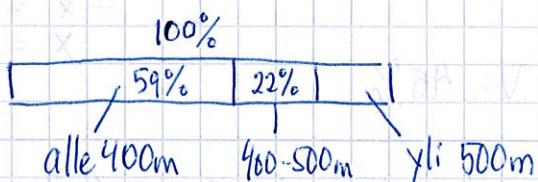


$$\text{a) teltissa } \frac{1}{2} = 50\%$$

$$\text{b) mökkeissä } \frac{2}{5} = \frac{40}{100} = 40\%$$

$$\text{c) leirikeskuksessa } 100\% - 50\% - 40\% = 10\%$$

11



$$\text{a) yli 500 m: } 100\% - 59\% - 22\% = 19\%$$

$$\text{b) Prosenttiyksiköiden erotus } 59\% - (22\% + 19\%)$$

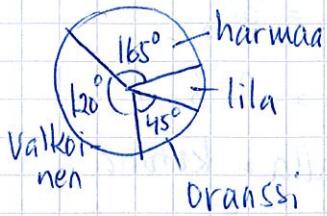
$$= 59\% - 41\%$$

$$= \underline{\underline{18\%}}$$

Syvennä
S.175

1 Murto-, desimaali- ja prosenttiluku

S1



Valkoinen

$$\frac{120^\circ}{360^\circ} = \frac{1}{3} \approx 33\%$$

harmaa

$$\frac{165^\circ}{360^\circ} = \frac{33}{72} = \frac{11}{24} \approx 46\%$$

orange

$$\frac{45^\circ}{360^\circ} = \frac{15}{24} = \frac{1}{8} = 0,125 = 12,5\%$$

lila

$$\frac{360^\circ - 120^\circ - 165^\circ - 45^\circ}{360^\circ} = \frac{30}{360} = \frac{1}{12} \approx 8,3\%$$

S2



30% 20%

Vain saksaa $50\% - 20\% = 30\%$

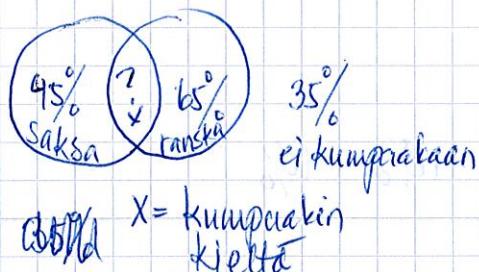
Vain ranskaa $60\% - 20\% = 40\%$

Kumpaakin 20%

Yhteensä kielia valitsi $30\% + 40\% + 20\% = 90\%$

Ei valinnut kielia $100\% - 90\% = 10\%$

S3



Vain Saksa + Vain ranska + kumpikin + ei mitään = 100%

$$(45-x) + (65-x) + x + 35 = 100$$

$$45-x + 65-x + x + 35 = 100$$

$$145 - x = 100$$

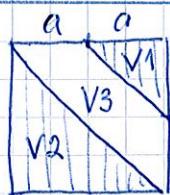
$$-x = -45$$

$$x = 45$$

$$\begin{aligned} & 145 - 145 \\ & -x = -45 \\ & x = 45 \end{aligned}$$

V: 45%

S4



Koko nelion pinta-ala $A = 2a \cdot 2a = 4a^2$

a) Viiletti pinta-ala $A_{V1} + A_{V2}$

$$= \frac{a \cdot a}{2} + \frac{2a \cdot 2a}{2}$$

$$= \frac{a^2}{2} + \frac{4a^2}{2}$$

$$= \frac{5a^2}{2}$$

Prosentteinoi $\frac{5a^2}{2} : 4a^2 = \frac{5a^2}{2 \cdot 4a^2} = \frac{5}{8} = 62,5\%$

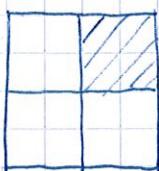
b) Valkoinen pinta-ala $A_{V3} = A_{V2} - A_{V1} = \frac{4a^2}{2} - \frac{a^2}{2} = \frac{3a^2}{2}$

Prosentteinoi $\frac{3a^2}{2} : 4a^2 = \frac{3a^2}{2 \cdot 4a^2} = \frac{3}{8} = 0,375 = 37,5\%$

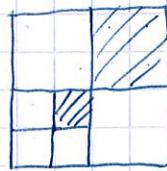
Syvennä
S..175

1. Murto-, desimaali- ja prosenttiluku

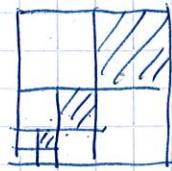
S5



$$\frac{100\%}{4} = 25\%$$



$$\begin{aligned}\frac{100\%}{4} + \frac{100\%}{16} \\ = 25\% + 6,25\% \\ \approx 31,3\%\end{aligned}$$

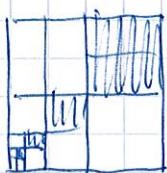


$$\begin{aligned}\frac{100\%}{4} + \frac{100\%}{16} + \frac{100\%}{64} \\ = 25\% + 6,25\% + 1,5625\% \\ \approx 32,8\%\end{aligned}$$

↑
Mahd.
pyöristys viimeksi
tarkkoja
arvoja

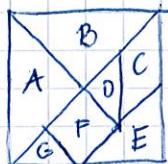
S5

b)



$$\begin{aligned}100\% - \frac{100\%}{4} + \frac{25\%}{4} + \frac{6,25\%}{4} + \frac{1,5625\%}{4} \\ \approx 66,8\%\end{aligned}$$

S6



Koko neliö $4 \cdot 4 = 16$ ruutua

$$A: \frac{4}{16} = \frac{1}{4} = 25\%$$

$$B: \frac{4}{16} = \frac{1}{4} = 25\%$$

$$C: \frac{2}{16} = \frac{1}{8} = 12,5\%$$

$$D: \frac{1}{16} = \frac{12,5\%}{2} = 6,25\%$$

$$E: \frac{2}{16} = \frac{1}{8} = 12,5\%$$

$$F: \frac{2}{16} = 12,5\%$$

$$G: \frac{1}{16} = 6,25\%$$

S7-9 Paras tapa kokeilemalla Tangramilla.